THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
June 1, 1987 · Vol. XXI · No. 22 · $2/Copy · $44/Year

COMPUTERWORLD

INSIDE

Happy Anniversary, *Computerworld.* Center pullout section.

In Depth — MIS sticks its nose into user-developed software. **Page 83.**

NCR joins the parade of 80386-based systems and offers first public endorsement by a PC maker of Microsoft's MS OS/2. Page 7.

Joint sales calls likely from DEC, Cray; connectivity pact set for announcement this week. Page 14.

Personal System/2 family to be linked to Banyan's network operating system at Comdex/Spring today. Page 125.

IBM plans to distribute Netview functions in upcoming series of announcements. Page 6.

Full IBM compatibility and VS connectivity bolster Wang's latest desktop offerings. Page 39.

OS/2 kit ships early

Developers brave bugs for jump on applications

BY ED SCANNELL
and DOUGLAS BARNEY
CW STAFF

Prompted by heavy demand from corporate and third-party developers, Microsoft Corp. last week began shipping its MS OS/2 Software Development Kit to more than 1,200 customers, two months ahead of schedule.

For now, however, a tool kit for the long-awaited next-generation personal computer operating system will be available only from Microsoft. IBM last week said it will wait until July to ship its version of the tool kit and outlined several differences between the IBM and Microsoft versions.

Microsoft will also ship the graphical Presentation Manager component of the MS OS/2 tool kit by August 1, more than a month ahead of its original fall schedule, according to Steve Ballmer, vice-president of systems software at Microsoft.

Developers have told Microsoft they are willing to put up with a less refined OS/2 in order to get it early, Microsoft said. As a result, Microsoft is shipping a preliminary version of the product that contains bugs and certain performance deficiencies.

Microsoft's tool kit is also complex. The product's documentation is about 2,000 pages long for the operating system kernel alone, with the documentation for the entire tool kit weighing some 75 pounds. "It is the biggest physical package we have ever shipped, and it has more pages than anything else we have ever shipped," said Jon Shirley, president of Microsoft, in an interview last week.

While IBM and Microsoft are jointly developing OS/2, the two firms last week described subtle

Continued on page 8

Lessors battle over buy-out bid

BY CLINTON WILDER
CW STAFF

SYRACUSE, N.Y. — Continental Information Systems Corp. last week moved to create a giant computer leasing company with an agreement to acquire competitor CMI Corp. But the move drew a bitter response from CMI founder and President Edward Cherney, who filed suit to block the bid and instead to allow him to purchase CMI from its parent company.

CIS Chairman and President Harry E. Goetzmann Jr. said he considers Cherney's action a nuisance suit and expects the court to approve CIS's acquisition for $50 million in cash. "We intend to close the deal within 30 days and to own the company," he said. "Anybody can sue anybody, but whether it goes anyplace is

Continued on page 126

Service wars: Rivals gun for IBM's CSA

BY STANLEY GIBSON
CW STAFF

Turning up the heat in the equipment maintenance battle, two major service providers, Sorbus, Inc. and Control Data Corp.'s Engineering Services Division, are set to announce this week programs that answer the challenge of IBM's Corporate Service Amendment.

Both CDC's Engineering Services Division and Sorbus maintain IBM's and other major vendors' equipment.

CDC's Engineering Services is offering a discount pegged at 10% below the cost of IBM's three-year CSA. The plan, like IBM's CSA, offers free 24-hour service seven days a week. Slated to be announced today, the new program will become available July 1.

Sorbus, meanwhile, reportedly will announce a 90-day money-back service plan for 4381 users and several other new offerings at Comdex/Spring '87 in Atlanta. Sorbus is also expected to make public a plan already in effect to give users added discounts for establishing help desks and signing up for two-year contracts.

In April, IBM revamped its CSA by adding the 24-hour service, reducing withdrawal penalties and offering a five-year option along with substantial discounts. Those changes become effective today.

Stiff competition

The revised CSA plan poses a stiff challenge to third-party maintenance providers such as Sorbus and CDC's Engineering Services, which have offered less costly service than IBM.

The CDC plan was constructed after careful review of IBM's CSA — both in tying the price to CSA and in removing what some customers might consider to be obstacles in IBM's plan.

"Our plan is to alleviate the inconvenience that many users are certain to experience when attempting to receive certifica-

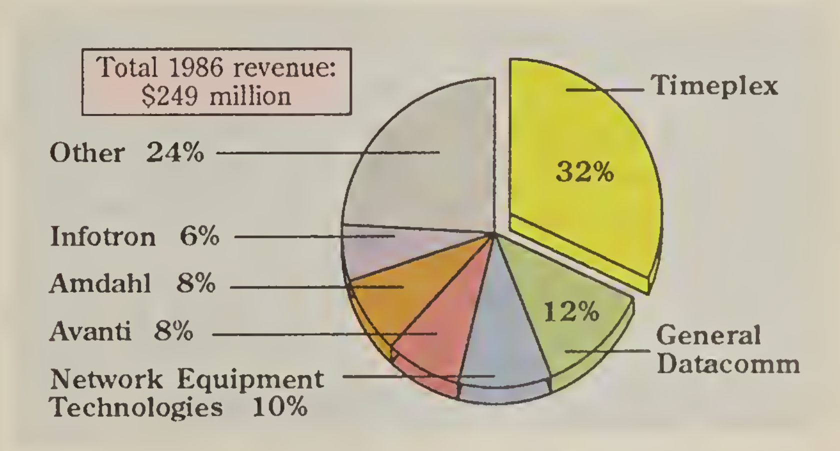
Continued on page 4

Turf struggle looms in T1 market

BY ELISABETH HORWITT
CW STAFF

Playing to strength

Timeplex and Network Equipment Technologies each plan to target the other's specialty in T1 multiplexer market battle



INFORMATION PROVIDED BY THE YANKEE GROUP AND SALOMON BROTHERS, INC.
CW CHART: MITCHELL J. HAYES

Archrivals Timeplex, Inc. and Network Equipment Technologies are expected shortly to announce products that directly invade each other's T1 networking territory.

Redwood City, Calif.-based NET, which dominates the high end of the T1 market, will unveil its lowest capacity system to date, competing in a segment historically belonging to Timeplex. In turn, Timeplex, based in Woodcliff Lake, N.J., will leapfrog NET's high-end systems with a 100-line T1 network.

This week, NET is expected to announce the IDNX/20, which will support between one and eight T1 links and is aimed directly at the low end of Timeplex's Link family of T1 switches. "NET has said that the IDNX/20 is most cost-effective in the one-to-three T1 line configuration, and Timeplex is really the only other vendor down in that range," said William Rahe, vice-president of the Enterprise Networking Strategies Division of the Gartner Group, Inc. in Stamford, Conn.

The IDNX/20 is significant because it is cost-effective for small user sites and is fully compatible with NET's high-end networking switch, the IDNX/70, Rahe said. He estimated that the system's starting price will be $30,000.

On June 23, Timeplex is expected to unveil its long-awaited Link/100 T1 networking system, which will employ a new networking architecture and will support in excess of 100 T1 lines, according to Timeplex spokesman Anthony Squeglia.

This gives Link/100 an edge

Continued on page 124

NEWSPAPER

IN THIS ISSUE

Family planning. NCR introduces family of PC-compatible systems based on split-board, modular architecture. Supporting a variety of 5¼- and 3½-in. hard and floppy drives, the systems include a low-cost workstation, an entry-level PC AT clone, a high-end 80286-based PC and an 80386-based PC. Page 7.

NEWS

4 Apollo, Prophecy team up to hit Wall Street.

6 IBM outlines Netview enhancement plans.

6 Aion expert system runs alongside transaction-processing application.

6 DG links PCs, mainframes via DG minis.

8 AST delays PS/2 board shipment while Orchid proceeds without authorization.

8 Microsoft agrees to future incorporation of firm's natural language.

10 Relia enhances Cobol compiler.

10 Ashton-Tate revamps slow-selling pay-for-support program.

12 Senate passes bill for federal privacy safeguards.

12 Investors await 3Com-Microsoft LAN Manager.

13 Apple readies improved file server for Mac.

14 DEC, Cray plan joint marketing venture.

14 X/Open chief outlines group's strategy.

15 Users cut general trade show attendance, travel to industry-specific confabs.

19 Users agonize over obsolete cabling systems.

124 Experience shows that ADAPSO, IIA merger won't be easy.

125 Alloy's Comdex announcements include PC Slave upgrade.

125 Banyan demonstrates support for PS/2, Appletalk at Comdex.

125 ADR/Adlib allows users to develop applications on PCs with mainframe environment.

126 Amdahl names new chairman.

SOFTWARE & SERVICES

25 IBM expands library of math subroutines, introduces version of Pascal.

25 Pansophic's Telon Version 2.0 features IBM DB2, SQL support.

25 M&D adds Materials Management System to PIOS line.

Who's got the key to your data? Page 75.

MICROCOMPUTING

39 Wang clones IBM PCs, forges VS link.

39 Demand for desktop publishing doesn't justify ballyhoo, study says.

39 Bank uses PC Tracker to organize inventory.

39 SST develops memory-resident SQL engine.

NETWORKING

53 Early LU6.2 implementor widens peer-to-peer link into distributed processing system.

53 Quadram enters Quadstar family into Starlan networking market.

53 ICA unveilings boost private network-user availability of subrate digital multiplexing.

SYSTEMS & PERIPHERALS

69 Chicago surgeons choose Sequent supermini to automate surgical procedures reporting.

69 Arete adds 16-user multiprocessor to low end.

69 Link ASCII/ANSI terminal features hardware modularity.

Quotable

"The architecture is always seamless and easy; it's when you get to the products that it gets tough."

LARK ALLEN
MANAGER,
TELECOMMUNICATIONS
MARKETING SUPPORT
IBM

MANAGEMENT

87 MIS execs honored for innovative use of information systems.

87 Pacific Bell compensation plan motivates information systems pros.

COMPUTER INDUSTRY

95 Seagate CEO talks about IBM relationship.

95 Rodime, IBM duel over Winchester technology.

95 Australian competitor acquires Ryan-McFarland.

EMPLOYMENT TODAY

106 MIS, DP managers define the perfect job.

20th ANNIVERSARY SECTION

Computerworld celebrates the age of MIS in its 20th anniversary edition.

Center pullout section.

IN DEPTH

75 Trying to secure your long-distance data transfers? Encryption may be a solution. By G. Berton Latamore.

83 What if you had veto power over all the software your end users developed? By Robert Peterson.

OPINION & ANALYSIS

20 Grayson is LAN-locked by sales problems.

25 Babcock reads software in IBM hardware news.

39 Zachmann solves the mystery of desktop publishing with Ready, Set, Go.

53 Horwitt is hung up on Sprint and MCI services.

69 Mikita follows the path of dual standards.

87 Adler addresses Europe's technology trends.

95 Wilder stands up for computer lessors' marriages.

DEPARTMENTS

20 Editorial

87 Book Reviews

93 Calendar

118 Buy Sell Swap

EMC woos 9335 buyers

Claims assembly bests IBM's 9335 performance

BY STANLEY GIBSON
CW STAFF

HOPKINTON, Mass. — EMC Corp. will ship an IBM 9335-compatible disk drive and controller within 45 days, the company told *Computerworld* last week.

The assembly will cost approximately 15% less than IBM devices, and EMC claimed it will offer a performance improvement of 15% to 25% over IBM's 9335 and 3370 direct-access storage devices (DASD) and controllers, with which the assembly will compete.

Like IBM's 9335, the EMC E335 Guardian was designed to work with both IBM's System/38 and 9370 minicomputers. The subsystem is made up of a controller device and one to four 855.8M-byte DASDs. Up to 3.4G bytes can be configured from one controller, EMC said.

"This new subsystem directly addresses and overcomes the problem of performance degradation encountered by early users of IBM's new 9335 subsystem," said John Garrahan, EMC's senior product manager.

IBM recently made an engineering change to its A01 controller, which is said to correct a performance problem that had caused the 9335 drive to perform no better than the 3370 DASD it replaces [CW, May 11].

Garrahan claimed the performance improvement in the E335 is the result of a 64K-byte buffer that can hold an entire disk track of information. IBM's buffer holds only 4K bytes, he said.

Garrahan also said that the use of two microprocessors, one in the controller and the other in the DASD, operating in a master-slave configuration, contribute to the boost in performance over IBM's levels. "The dual microprocessors can handle more work," he said.

Diagnosis included

The E335 also includes a diagnostic package that allows the user to monitor disk conditions and possibly avoid malfunctions, EMC said.

The subsystem includes an E335-A01 controller, an E335-B01 DASD and an E309 enclosure. A subsystem can be configured using one or two controllers and up to four DASDs, and it can be mounted in IBM's 9309 enclosure.

The controller is priced at $6,800. Each DASD lists for $17,500, and the enclosure costs $3,000. A fully configured subsystem with two controllers and four DASDs in EMC's enclosure is priced at $83,630.

Although EMC designed and manufactured the controller, the drives that work with it are made by NEC Corp.

Apple enters R&D pact to develop OSI net tools

BY DONNA RAIMONDI
CW STAFF

Apple Computer, Inc. last week firmed up its commitment to Open Systems Interconnect (OSI) network standards through a minority investment in Touch Communications, Inc., an OSI networking software house. The companies also announced joint software development efforts that will port Touch's OSI software to the Apple Macintosh environment.

Neither company would disclose terms of the agreement. The investment came from Apple's venture capital arm, the Strategic Investment Group, said director Dan Eilers, and the deal includes other venture capitalists. Apple said it will not assume a seat on the Touch board of directors and that it does not intend to increase its financial interest in Touch in the future. "Touch's value to Apple has to do not only with their [future] Apple products but also with their expertise in the IBM and Digital Equipment Corp. environments," Eilers explained.

The two companies will cooperate on the development of OSI networking software products for Apple's Macintosh personal computers that will allow interoperability with IBM and DEC equipment.

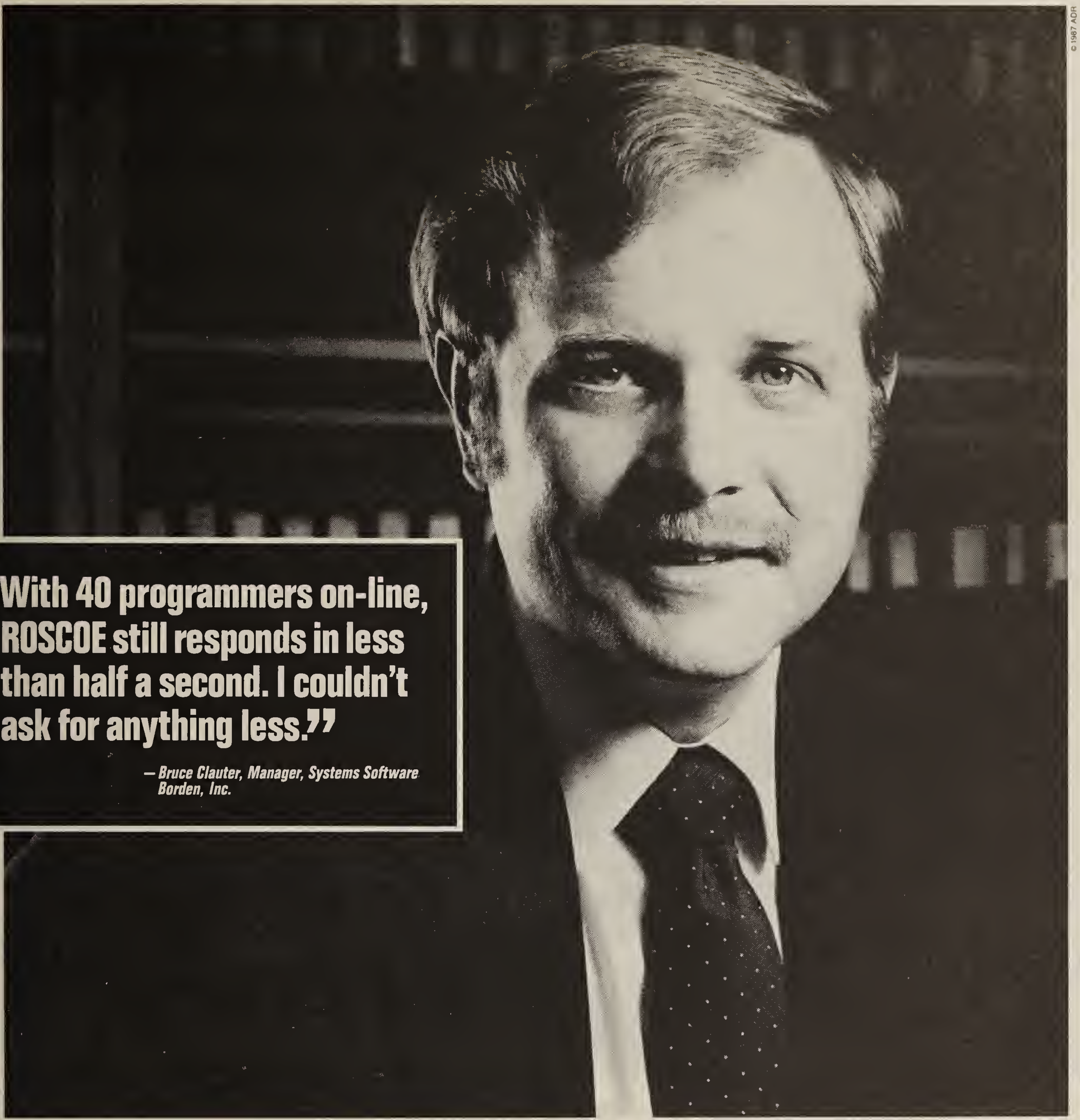
Multivendor links

Touch's OSI products are said to link different vendors' equipment while keeping transparent user interfaces.

Users will be able to access files on the DEC or IBM system via the Macintosh's mouse and file folder interface, said Michael Szabados, Apple's manager of networking and communications product marketing.

The first product, an implementation of Touch OSI that currently can link IBM and DEC equipment on a network through OSI protocols, will be available by the end of the year, the firm said. A prototype exists today but does not include all segments of the OSI code, Szabados said.

© 1987 ADR



“With 40 programmers on-line, ROSCOE still responds in less than half a second. I couldn’t ask for anything less.”

—Bruce Clauter, Manager, Systems Software
Borden, Inc.

When it comes to programming, time is indeed money. A lot of money. So the surest way to cut the cost of programming is to make it go faster.

That’s why thousands of companies like Borden, Inc., the Iowa Power and Light Company and Giant Food Inc. use ADR/ROSCOE.®

Borden’s programmers get more work done with ROSCOE because it gives them more time to work with the computer. Forty programmers can work at the same time and still get half second response times.

They speed up the programming process by using ROSCOE’s high level procedural language to recreate typical program routines with a single command. And its screen painting facility to generate code automatically.

ROSCOE also helps Borden get more from their computers. Even with 40 programmers, ROSCOE’s single address space architecture still uses less than 5% of their CPU. Which has helped them delay expensive hardware upgrades.

And ADR® can help you get the most from ROSCOE with our pre-installation consulting service, training programs and worldwide support network that solves most common problems over the phone.

To learn how ROSCOE can unlock the potential of your people and computers call 1-800-ADR-WARE.

ADR PERFORMANCE SOFTWARE.
Unlock the potential.

ADR

AN AMERITECH COMPANY

Applied Data Research, Inc. Orchard Road & Rt 206, CN-8, Princeton, NJ 08540 1-201-874-9000.

Service wars

FROM PAGE 1

tion for IBM's CSA, while at the same time offering the same benefits at a more attractive price," said Gary Mertz, vice-president of marketing for CDC's Engineering Services Division.

Available for both networks and hardware, all equipment covered under the IBM plan is also covered under the CDC plan, Mertz said. Users signing up for IBM's CSA must prove they have problem-tracking and resolution measures in place by completing a questionnaire containing some 370 questions on both hardware and networks.

The cost for taking the exam is $3,500 for the hardware test and $8,600 for the networks test. The IBM hardware and network exams take about one day each to complete, according to users who have taken them.

To qualify for the CDC discount, customers must maintain a help desk and a full-time, trained data processing professional on-site to serve as the contact for maintenance. CDC qualifies accounts by asking some 30 questions during an interview that can take two hours, according to the company.

No charge for sign-up

Unlike IBM, CDC requires no charge to sign up or to terminate, guarantees a price for the term of the agreement and specifies that equipment will not be dropped from the plan while it's in effect, Mertz said.

Users may renew the CDC contract for a second year, under the same terms as the first year, if they give notice six months before the end of the contract.

Users wishing to renew after that may do so any time prior to the contract expiration date, thus locking in maintenance prices for that term at the price that exists on the date renewal notice is given.

Jim Paster, marketing manager for the IBM segment of CDC's Engineering Services, pointed out that according to these guidelines, a customer may sign up for two or three years to begin with, locking in maintenance prices for that time period. He pointed out that IBM's service prices are not locked in, but may increase within limits each year.

Paster also noted that CDC's plan is not automatically renewed unless canceled by the customer, as is IBM's CSA. He said this feature gives CDC's customers greater flexibility.

In its so-called "Challenge Plan" for 4381 users, Sorbus is allowing users to cancel after 90 days if not satisfied, with all fees refundable, according to Bill Patch, Sorbus's vice-president of marketing and planning.

In early May, Sorbus began offering discounts to customers who sign up for two years, although the program was not yet formally announced.

In addition, Sorbus is offering discounts for companies that have help desks. A user can obtain both discounts, which will be added together.

However, Sorbus declined to specify the amount of the discount in each case, except to say that the discounts would be fundamentally the same for all customers.

Between IBM and others

"We're in between IBM and the rest of the independents. In order to keep our position, we've got to be a little creative," Patch explained.

In the next 30 to 45 days, Patch said, Sorbus will announce three- and four-year contracts. Equipment in a single shop can be placed under any of the available contract periods and need not be all under one term, Patch said.

In contrast to IBM, but like CDC, Sorbus is not charging initialization or termination fees and is locking in its service rates for the duration of the contract.

Patch said that rather than charge for early termination, Sorbus was offering the "positive incentive" of one month's free service at the end of the contract for those who stay on for the full period. Sorbus is not throwing in free service 24 hours, seven days a week, however. "The customer who doesn't need it pays for those who do," Patch said.

Both Sorbus and CDC report that many users have been delaying service decisions in order to thoroughly examine IBM's CSA.

Service points

CDC fine-tunes service plan to compete with IBM's CSA

CDC		IBM
Yes	24-hour, seven days a week coverage at no charge	Yes
No	Charge for certification	Yes/ $3,500 to $8,600
Yes (30 questions)	Certification questionnaire response required	Yes (369 questions)
Yes	Vendor has option to decertify	Yes
No	Charge for recertification	Yes
Yes	Requires customer-supplied "help desk"	Yes
No	Vendor may drop products from eligibility	Yes
One year with option to renew for one year	Contract term	One, three or five years
10% under IBM three-year CSA prices	Pricing	Discounts 15% to 30% off of base price
No	Price increase permitted	Yes/3.5% per year

INFORMATION PROVIDED BY CONTROL DATA CORP.

Apollo weds Contessa

BY NINAMARY BUBA MAGINNIS
CW STAFF

CHELMSFORD, Mass. — Apollo Computer, Inc. and Prophecy Development Corp. reportedly will market an advanced workstation-based development environment designed for financial applications such as securities trading, arbitrage identification, insurance underwriting and optimization of government securities allocations.

Prophecy's Contessa, a resource management system, has been ported to Apollo's full line of professional workstations, the hardware vendor announced last week. Contessa is a menu-driven, flexible application builder that enables end users such as securities traders and analysts to write their own programs using natural language to define a knowledge base, reported Michael Frank, Apollo's financial services market manager.

The software development package reportedly allows nontechnical personnel to develop robust analysis and decision support systems without using a programming language or a computer programmer.

Coupled with other third-party agreements with business software vendors, Apollo, like competitor Sun Microsystems, Inc., is aggressively targeting the Wall Street crowd.

Can access data

With Contessa on Apollo workstations, traders will be able to access information such as stock and bond prices, world currency fluctuations and other historical data used in buying and selling decisions.

Contessa reportedly can analyze vast amounts of data at high speeds. Apollo expects to leverage its work-group workstation line and multiwindowing features to garner business on Wall Street, Frank said.

The vendor will host a general-purpose meeting on Wall Street this week with MIS directors and data processing professionals from among the top 50 New York financial firms. At the meeting, Apollo will announce the opening of a Manhattan office that will provide a host of sales, service and support personnel, he added.

CORRECTIONS

CPT Corp. [CW, April 20] is located at P.O. Box 295, 8100 Mitchell Road, Minneapolis, Minn. 55440.

Lotus 1-2-3/M [CW, May 4] will be marketed by both Lotus Development Corp. and IBM but will be distributed exclusively by IBM.

The T1 multiplexers chart in Spotlight [CW, April 27] omitted the Infostream NX3000 Network Exchange, priced at $10,000, and the Infostream NX4600, priced at $20,000. The multipoint T1 multiplexing switches, both from Infotron Systems Corp. in Cherry Hill, N.J., support up to 4,096 data channels in addition to voice and offer drop-and-insert capability, remote multiplexer download, automatic rerouting and network control. Both are byte-interleaved and offer AT&T Digital Access and Cross-Connect Systems compatibility as well as D4 and Extended Superframe framing structures.

The budget for IBM's internal MIS department [CW, May 18] grew by 3% in 1986. The 18% growth figure refers to the 1985 budget.

Two numbers were switched in a chart accompanying "IBM carves path to high-end CPUs" [CW, May 25]. The correct price of an MVS/Extended Architecture operating system license before a recent series of IBM revisions was $592,629.

COMPUTERWORLD

Editor in Chief
Bill Laberis
Executive Editor
Paul Gillin

News Director
Peter Bartolik
Senior Editors
James Connolly, Systems
Clinton Wilder, Industry
Elisabeth Horwitt, Networking
Charles Babcock, Software
David Ludlum, Management
Douglas Barney, Microcomputing
Patricia Keefe, Networking
Ed Scannell, Microcomputing
Senior Writers
Donna Raimondi, Rosemary Hamilton
Stanley Gibson, David Bright
Ninamary Buba Maginnis
Staff Writer
Alan J. Ryan
New Products Editor
Suzanne Weixel

Features Director
George Harrar
Senior Editors
Janet Fiderio
Glenn Rifkin
Joanne Kelleher
Associate Editors
Amy Sommerfeld Fiore
Deborah Fickling, Penny Janzen
Assistant Editor
Kelly Shea
Senior Writer
Michael L. Sullivan-Trainor
Researcher
Sally Cusack
Assistant Researcher
Bonnie MacKeil

Managing Editor
Donovan White
Chief Copy Editor
Patricia Heal Erickson
Assistant Chief Copy Editor
Steven M. Ulfelder
Copy Editors
David W. Bromley, Mary Grover
Martha E. Ruch, Sharon Baker
Laura O'Connell, Marie T. Burke
James Daly

Design Editor
Marjorie Magowan
Graphics Editor
Mitchell J. Hayes
Graphic Designer
P. Charles Ladouceur

Assistant to the Editor in Chief
Parth Domke
Editorial Assistants
Patricia Faherty, Christie Sears
Linda Gorgone
Rights and Permissions Manager
Nancy Shannon

News Bureaus
Mid-Atlantic
201/967-1350
Alan Alper, Correspondent
Washington, D.C.
202/347-6718
Mitch Betts, Correspondent
West Coast
415/328-8064
Jeffry Beeler, Chief
James A. Martin, Correspondent
Midwest
312/827-4433
Jean S. Bozman, Correspondent

IDG News Service
Susan Blakeney, Director

Main Editorial Office
Box 9171, 375 Cochituate Road
Framingham, MA 01701-9171
617/879-0700

Computerworld is a publication of IDG Communications, the world's largest publisher of computer-related information. IDG Communications publishes over 80 computer publications in more than 28 major countries. Fourteen million people read one or more IDG Communications publications each month. IDG Communications publications contribute to the IDG News Service offering the latest on domestic and international computer news. IDG Communications publications include: ARGENTINA'S *Computerworld Argentina, PC Mundo;* ASIA'S *Communications World, Computerworld Hong Kong, Computerworld Indonesia, Computerworld Malaysia, Computerworld Singapore, Computerworld Southeast Asia, PC Review;* AUSTRALIA'S *Computerworld Australia, Communications World, Australian PC World, Australian Macworld;* AUSTRIA'S *Computerwelt Oesterreich;* BRAZIL'S *DataNews, PC Mundo, Micro Mundo; CHILE'S Informatica, Computacion Personal;* DENMARK'S *Computerworld Danmark, PC World Danmark;* FINLAND'S *Mikro, Tietoviikko;* FRANCE'S *Le Monde Informatique, Distributique, InfoPC, Le Monde Des Telecoms;* GREECE'S *Micro and Computer Age;* HUNGARY'S *Computerworld SZT, Mikrovilag;* INDIA'S *Dataquest;* ISRAEL'S *People & Computers Weekly, People & Computers Biweekly;* ITALY'S *Computerworld Italia;* JAPAN'S *Computerworld Japan;* MEXICO'S *Computerworld Mexico;* THE NETHERLANDS' *Computerworld Netherlands, PC World Benelux;* NEW ZEALAND'S *Computerworld New Zealand;* NORWAY'S *Computerworld Norge, PC World Norge;* PEOPLE'S REPUBLIC OF CHINA'S *China Computerworld, China Computerworld Monthly;* SAUDI ARABIA'S *Arabian Computer News;* SOUTH KOREA'S *Computerworld Korea, PC World Korea;* SPAIN'S *Computerworld Espana, Commodore World, PC World Espana, Communicaciones World, Informatica Industria;* SWEDEN'S *ComputerSweden, Mikrodatorn, Svenska PC World;* SWITZERLAND'S Computerworld Schweiz; UNITED KINGDOM'S *Computer News, DEC Today, ICL Today, PC Business World;* UNITED STATE'S *Amiga World, Boston ComputerNews, CD-ROM Review, Computerworld, Computers In Science, Digital News, Federal Computer Week, 80 Micro, FOCUS Publications, InCider, Infoworld, Macworld, Computer + Software News (Micro Marketworld/Lebhar-Friedman), Network World, PC World, Portable Computer Review, Publish! PC Resource, Run;* VENEZUELA'S *Computerworld Venezuela;* WEST GERMANY'S *Computerwoche, PC Welt, Run, Information Management, PC Woche.*

GUESS WHERE SYNCSORT DOS LEAVES EVERY OTHER SORTING PROGRAM.

SyncSort DOS is so fast, it's no wonder it leaves other sorts at the starting gate.

With our speed, you'll see dramatic reductions in the use of your computer resources. (Meaning CPU Time, SIOs, disk work space and the like.)

And to leave our competition even further in the dust, we have features designed to make any programmer a thoroughbred performer.

Plus our service is almost as fast as our sorts —over 85% of all service requests are resolved within 24 hours.

To arrange to test SyncSort DOS on your system, call us at **201-930-9700.** That way, you can compare us to the sort you're currently using.

We're just afraid it won't be much of a horse race.

syncsort

THE BEST OF SORTS.℠

© 1987 Syncsort Incorporated, 50 Tice Boulevard, Woodcliff Lake, NJ 07675.

Distributed Netview pledged

Will have version of net management system for low-end VM hosts

BY ELISABETH HORWITT
CW STAFF

BOSTON — IBM plans to enhance Netview, its centralized, 370-based network management system, during the next few months so that its functions can be distributed among a network of different-size IBM computers, according to the company.

During a telecommunications seminar held here last week, IBM outlined its strategy for making Netview the industry standard for managing multivendor voice and data networks. "The next round of announcements [from IBM] will be a major step forward with network management," commented Lark Allen, IBM's manager of telecommunications marketing support.

In a separate interview with *Computerworld*, Allen detailed how IBM intends to continue grooming Netview for its expanded role. "Announcements that will happen over the next few months will allow for a distributed Netview," he said.

Limited Netview expected

Key among the introductions should be a more limited and lower cost version of Netview designed for low-end VM hosts, such as IBM's 4300 and 9370, and features that allow network management functions to be distributed over multiple Netview nodes. An IBM Personal System/2 version of Netview/PC also may be in the works, a company spokeswoman indicated.

IBM also soon plans to announce some major enhancements to Netview's user interface, which has long been compared unfavorably with the graphics-based mouse-driven network management systems of many T1 vendors, Allen said. "Now that the critical pieces are in place, we can turn to presentation," he added.

Frank Dzubeck, president of Washington, D.C., consulting firm Communications Network Architects, theorized that IBM is holding off on a new Netview user interface until it can be made compatible with the presentation aspects of the Common User Access element of the company's Systems Application Architecture.

IBM Netview-related introductions that will take place this month, according to Dzubeck, include new versions of Netview that were designed just to handle low-end network data gathering and processing and to run on the 9370 and possibly 4300 VM systems as well. Companies that have installed 9370s as departmental processors at remote sites would want a more limited Netview that could be operated by a nontechnical worker and would be priced lower than the 370 version, Allen said.

Netview could thus be distributed across multiple 9370s, which would exchange data using the LU6.2 peer-to-peer protocol, Dzubeck said. IBM is expected soon to announce LU6.2 support for VM and VTAM environments on the 9370.

A multinode Netview would be more suitable than the original, centralized system for managing corporations' complex multivendor voice and data networks, Allen suggested. "You wouldn't want to send all of your network management information to the same host — you'd bury it," he noted.

A typical distributed Netview system would implement applications on different nodes that would perform functions such as problem management and performance tracking and communicate with a central host that would maintain an overall view of the network.

Need resource data base

"One of our requirements is a systemwide resource data base that knows where all the network components are and can tell me what changes I made in the last 24 hours," Allen explained.

IBM gave no definite time frame for availability of the resource data base.

Another element of the Netview system that may be due for an upgrade is Netview/PC, an IBM Personal Computer-based product that acts both as a limited Netview node that can monitor IBM Token-Ring and PC networks and as an intermediary between host-based Netview and non-IBM networking equipment. During a break between seminar sessions, IBM spokeswoman Alice Falcone said she would be surprised if IBM did not migrate Netview/PC to the PS/2.

A high-end PS/2 running OS/2 Extended Edition has several advantages over the PC in the dual role of network monitor and Netview front end, including built-in graphics interface and multitasking capabilities.

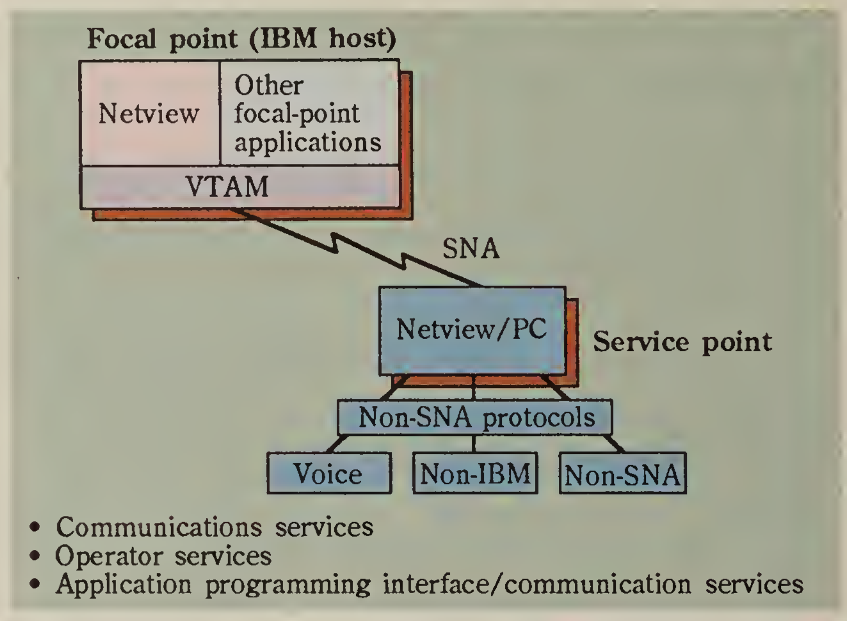
IBM still must wait for other vendors to throw their support behind Netview/PC as the network management standard for both voice and data. While approximately a dozen telecommunications vendors, such as Timeplex, Inc. and Network Equipment Technologies, officially support Netview/PC, IBM spokemen could not say how far these vendors have gone toward developing interfaces with the system that would allow their own diagnostic and monitoring systems to send data to Netview/PC and Netview. "There are a lot of meanings and levels to saying, 'We have Netview support,' just as there are for SNA support," Allen said.

Also still in question is whether major carriers — AT&T, in particular — will be willing to hitch their diagnostic systems to IBM's. Some carriers are evaluating whether there is a broad enough user base to warrant the linkup with Netview, Allen noted.

Allen pointed out that there is an advantage to having communications between the IBM host-based SNA network, in which data requests are generated, with the T1-based telecommunications links that deliver the data. "Suppose one guy switches all of the data lines on a T1 link to voice," he said. "You want a control system that can query him: 'Do you realize that if you do that, all of your 3725 [host-based] traffic will stop?' "

Netview/PC

IBM's Netview gets access to non-IBM network management data



INFORMATION PROVIDED BY IBM
CW CHART: SUSAN ALDAM

Expert system boosted for high-transaction use

BY CHARLES BABCOCK
CW STAFF

PALO ALTO, Calif. — An expert system shell from Aion Corp., the Application Development System (ADS), is being enhanced to allow it to provide decision-making expertise to a mainframe transaction-processing application as it runs.

Harry C. Reinstein, Aion president and a veteran of the IBM expert system environment development effort, last week said an expert system created with the new version of Aion's ADS will be able to run in its own IBM CICS region as a VTAM application. This will allow it to communicate directly with a transaction-processing application running in another CICS region, he said.

Thus, a CICS Cobol application will be able to incorporate a call to a nearby expert system whenever it needs the expertise of a rules-based, inference engine-powered application.

Aion is developing interfaces to IBM's transaction-oriented teleprocessing monitors, CICS/VS and IMS/VS, to work with expert systems produced from the shell and scheduled to be available early next year, company officials said.

The Palo Alto firm is one of a handful of expert system companies whose products work in the world of IBM mainframes and commercial data processing. While most expert systems are stand-alone applications that talk to a single user, "expert systems developed with Aion's shell will have a much higher bandwidth. They will be able to deal with heavy-duty transaction-processing applications," said Esther Dyson, editor of "Release 1.0," an industry newsletter.

In addition, Aion's inference engine or rules-processing component of the expert system will have a multitasking supervisor on top of it, allowing it to function with more than one application at a time, Reinstein said.

John P. Birch, vice-president of McCormack & Dodge Corp. in Natick, Mass., said his firm is using the Aion shell for an internal expert system devoted to support personnel. Other expert system shells "have more elaborate functions and are more elegant," he noted, but Aion's has "the best human interface. The thing that shoots the others down is they are usable only by a genius."

ADS for MVS will be priced at $70,000 and for VM, $60,000. The interface to IMS/VS will be an additional $25,000; for CICS/VS, $15,000. The expert system shell is also available on personal computers for $7,000.

DG to unveil PC net plan

BY NINAMARY BUBA MAGINNIS
CW STAFF

WESTBORO, Mass. — Data General Corp. plans to unveil this week Personal Computer Integration (PCI), a flexible networking scheme that is intended to connect IBM Personal Computers and compatibles to mainframes via DG minicomputers.

According to Joseph Forgione, DG's group manager of communications product marketing, PCI will be part of a three-tier networking approach in which departmental minicomputers will serve as go-betweens for personal computer users to link to mainframes. DG will leverage its minicomputer connectivity with IBM mainframes to offer customers a desktop-to-mainframe networking solution, he explained.

The networking architecture will reportedly include a series of protocols, local-area networks, communications software, hardware and utilities, allowing the minicomputers to act as file servers, disk servers or gateways into the corporate network or another DG computer, Forgione said. "That's where you get the uniqueness, flexibility and freedom of choice," Forgione noted. "A lot of companies give you file servers — but that's all they give you."

PCI provides a comprehensive networking platform so that users can initially operate the DG minicomputer as a file server, for example, and later set it up as a networking gateway, he explained.

Although additional applications may be required to convert the minicomputer from a file or disk server to a gateway, the fundamental tools will be in place to make the change, Forgione said.

PCI will adhere to industry networking standards hammered out by the Open Systems Interconnect (OSI) program and will include OSI's X.400 protocols as part of the new product set, he reported.

Using OSI standards, PCI will accommodate other systems such as Digital Equipment Corp. VAX and Wang Laboratories, Inc. OIS and VS computers, Forgione said.

NCR adds modular PC-compatible systems

BY ALAN ALPER
CW STAFF

NEW YORK — NCR Corp. last week introduced a family of IBM Personal Computer-compatible systems based on a modular architecture that enables users to upgrade or customize their machines by plugging boards into the system bus.

The Dayton, Ohio-based firm also announced support for Microsoft Corp.'s MS OS/2 operating system and a family of hardware and software products for local-area networking and wide-area and mainframe communications. With the commitment to OS/2 support, NCR becomes the first microcomputer vendor to publicly endorse the next-generation operating environment, according to Microsoft President Jon Shirley.

But whether NCR will unveil an IBM Personal System/2-compatible product is not as certain, said Vernon W. Yates, a corporate vice-president and general manager of NCR's Personal Computer Division. "You can get defocused by trying to chase someone else," he said. "But we'll go where the market goes; we don't drive the market."

The new NCR systems include the following:

- The 3392, NCR's second low-cost workstation, which supports diskless operation for networking applications.
- An entry-level IBM PC AT clone called the PC 710.
- A high-end Intel Corp. 80286-based machine — the PC 810 — aimed at users who foresee multiuser requirements or whose applications demand AT compatibility.
- The PC 916, an Intel 80386-based system positioned as a stand-alone workstation, departmental network server or communications gateway processor.

NCR said the systems will be available beginning in the fourth quarter and will be marketed through NCR's value-added reseller and retail channels. The products will also be sold to OEMs and directly to large customers, the company said.

NCR's existing PCs will continue to be marketed, but the PC 8 most likely will disappear, since the PC 810 offers faster processing and more upgrade flexibility with a small price differential, Yates said.

Boarding up for upgrades

All of the systems that debuted last week make use of NCR's split-board architecture. A second board, called the Personality Card, contains a video adapter, disk drive controllers, extended memory and serial and parallel ports. The four new PCs also support a variety of 5¼- and 3½-in. hard and flexible disk drive configurations, NCR said.

The split-board architecture and modular expansion capability enable users to upgrade their AT-compatible machines to 80386-based systems by replacing only the microprocessor board, noted Charles Exley Jr., NCR's chairman and president.

"The realities of the market do not support disruptive changes to systems plans. The realities of the market do support industry standards," Exley said. "They do support the need for a broad range of configurations, and they do require adaptability to future technologies."

The 3392 workstation uses the same incremental architecture approach as the 3390 workstation NCR unveiled last fall but offers twice the expansion card capability, NCR said. The workstation, which is based on a 10-MHz 80286 microprocessor and runs Microsoft's MS-DOS 3.2., comes with 640K bytes of random-access memory (RAM) — expandable to 1M byte — and a Personality Card, supporting color or enhanced graphics and up to 16M bytes of additional memory. Up to four hard or flexible disk drives can be attached to the system, NCR noted.

A diskless model lists for $1,974. An entry-level unit with a single 1.2M-byte, 5¼-in. floppy disk is priced at $2,199.

The PC 710 also uses the incremental architecture and is based on an 80286 running at 6 or 10 MHz. A base model with 640K bytes of RAM lists for $1,954. A high-end configuration adding a 20M-byte drive lists for $2,670.

The PC 810 comes configured with 640K bytes of RAM, expandable to 16M bytes. Prices for the 80286-based machine range from $2,950 for a basic system to $5,920. The high-end PC 916 comes with 2M bytes of RAM. Prices range from $6,353 to $8,653.

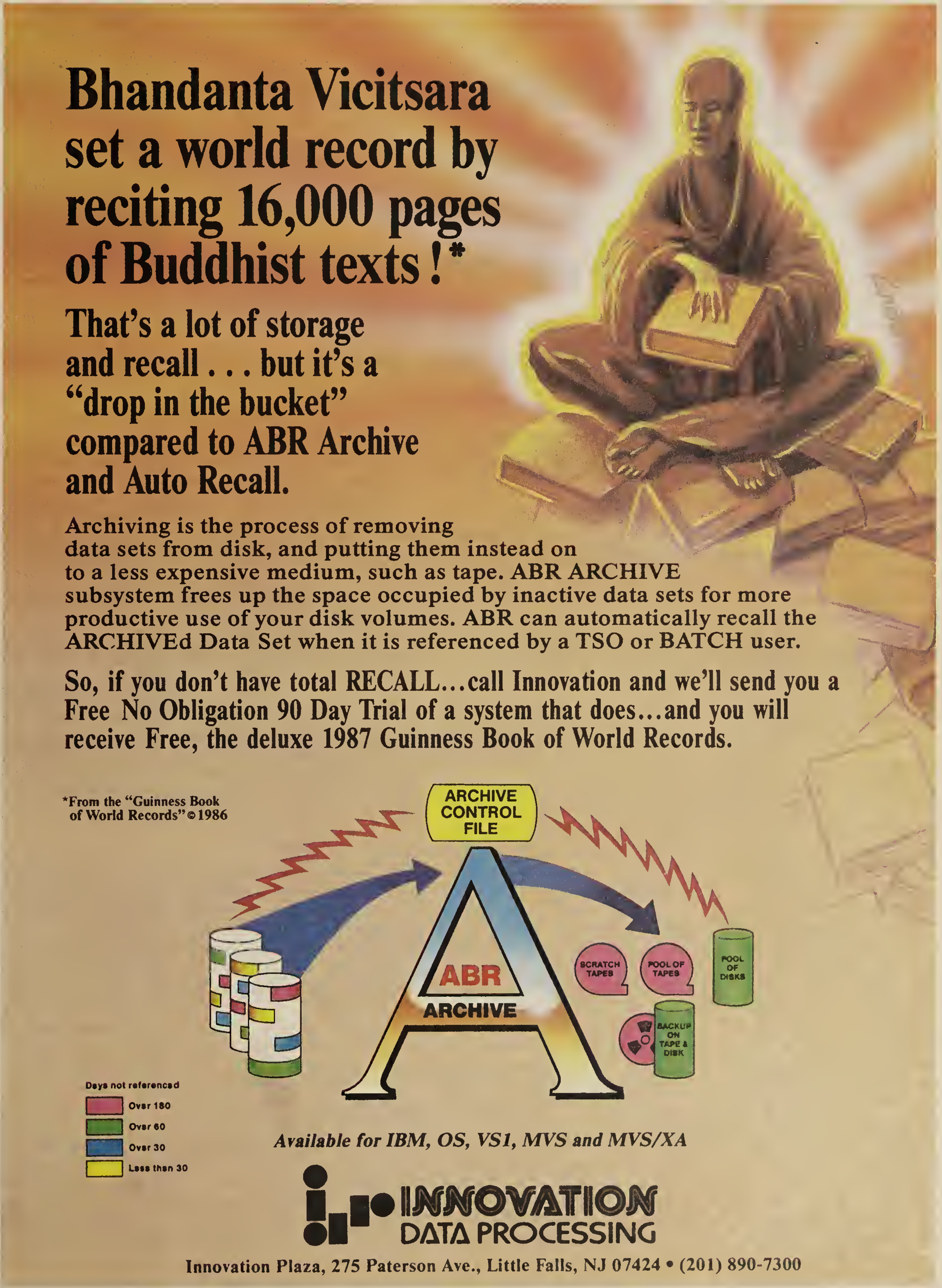
NCR PCs join token-ring

The firm unveiled a hardware and software product that it said enables NCR personal computers to operate on token-ring systems.

It consists of a PC adapter board and cable, an enhanced version of Microsoft's Networks network operating system, an IBM Netbios program and diagnostic software. NCR said the system supports diskless workstations, and all components are priced individually.

A multiprotocol adapter, priced at $595, supports Synchronous Data Link Control (SDLC), Binary SDLC and start-stop asynchronous communications. It supports two ports, each of which can be operated from 50 to 19.2K bit/sec.

A series of communications software packages that provide support for SDLC, token-ring and CCITT X.25 environments were also introduced.



Bhandanta Vicitsara set a world record by reciting 16,000 pages of Buddhist texts!*

That's a lot of storage and recall . . . but it's a "drop in the bucket" compared to ABR Archive and Auto Recall.

Archiving is the process of removing data sets from disk, and putting them instead on to a less expensive medium, such as tape. ABR ARCHIVE subsystem frees up the space occupied by inactive data sets for more productive use of your disk volumes. ABR can automatically recall the ARCHIVEd Data Set when it is referenced by a TSO or BATCH user.

So, if you don't have total RECALL...call Innovation and we'll send you a Free No Obligation 90 Day Trial of a system that does...and you will receive Free, the deluxe 1987 Guinness Book of World Records.

*From the "Guinness Book of World Records" © 1986

Available for IBM, OS, VS1, MVS and MVS/XA

INNOVATION DATA PROCESSING

Innovation Plaza, 275 Paterson Ave., Little Falls, NJ 07424 • (201) 890-7300

AST delays PS/2 board, waits for nod from IBM

BY JAMES A. MARTIN
CW STAFF

IRVINE, Calif. — AST Research, Inc., the leading maker of multifunction boards for IBM Personal Computers, has reportedly delayed shipping its first product for the IBM Personal System/2 family because of difficulties in obtaining authorization from the computer maker. The problems have derailed AST's plans to be the first independent company to provide add-in boards for the IBM Micro Channel architecture.

Meanwhile, AST rival Orchid Technology, Inc. in Fremont, Calif., said it will ship its first PS/2 expansion board without waiting for IBM approval.

AST is holding up shipment of its Advantage/2 2M-byte memory card until it receives an authorized identification number from IBM, officials said last week.

However, AST cofounder Thomas Yuen said IBM has not cooperated with the board maker's efforts.

"We can't even get an application form," Yuen said. "IBM gave developers a telephone number to call to get an application for an ID. We've had four or five engineers and senior managers calling constantly, and we haven't been able to get a call through. Without that identification number, we aren't sure the boards won't run into legal problems from IBM," he added.

An IBM spokesman said the company was not requiring third-party developers to apply for any product identification number.

"However, we are strongly encouraging vendors to obtain one in order to eliminate confusion," a spokesman said.

After physically installing an add-in card on a PS/2, a user is required to identify the card to the Micro Channel through a series of software codes. By having that special ID number from IBM, the user is ensured that the Micro Channel will interface correctly with the card.

"There is a possibility that the Micro Channel may not recognize" a board without that number, the spokesman added.

A spokesman for AST rival Orchid said his company has not applied for any special product identification from IBM but that he believes it has cleared all the necessary obstacles in building and shipping its Ramquest product.

Orchid is expected to unveil its Ramquest 50/60 at Comdex/Spring '87 this week in Atlanta, claiming that it is the first enhancement board for the Micro Channel architecture. The product is a 2M-byte expansion board that supports the Lotus/Intel/Microsoft Expanded Memory Specification.

"There was nothing in the technical specifications that said you had to ask for any kind of special identification number," the Orchid spokesman said.

Microsoft in link pact

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Microsoft Corp. this week is expected to reveal that it has licensed a natural language interface but does not expect new products to emerge from the agreement for at least three years.

Few details were disclosed by Microsoft. "Because it is a long-term thing, we are not going to give out very much information. It does not apply to our current product line. It is something we think will have application in future years," Microsoft President Jon Shirley said. The agreement, which allows Microsoft to use Natural Language, Inc.'s technology in perpetuity, limits Microsoft to only selling Natural Language's product as part of applications.

Despite the lack of detail, the Natural Language product appears to fit in with Microsoft's future data base strategy. Microsoft has a licensing agreement with Sybase, Inc. to use Sybase's SQL-oriented data base technology in Microsoft's data base software.

According to Natural Language President Bill Bozeman, his firm's primary product, Datatalker, is already customizable to work with a variety of data base applications.

Shirley, however, downplayed the role of Natural Language technology in Microsoft's data base strategy. "There is no connection between anything that we might be doing on the data base area and this. This is a very futuristic type of thing," he said. "It is more interesting as a generalized interface that could be used with a variety of products."

Microsoft is reportedly not entirely sure how the technology will be used, although Shirley said that the technology will be used in a fairly broad range of applications. "We are not at all sure how it will be best applied as micros develop."

OS/2 kit

FROM PAGE 1

differences in the approaches they are taking to the developers' versions.

According to developers briefed by IBM at a seminar in Greenwich, Conn., 10 days ago, one key difference is that IBM's version will support different languages than does the Microsoft version, including Fortran and Pascal, and will not include any debuggers.

Some developers said they will create their own debuggers, which is likely to slow the development process down. "We'll all be reinventing the wheel simultaneously," said one developer who attended the Greenwich seminar.

IBM's three languages of choice are Pascal, C and Fortran, with C the only language supported completely by IBM, some developers noted. "But as far as debugging tools go, they don't exist," one of the developers said.

Tool kit linkers differ

He added that the linkers in the IBM tool kit will be different from those used in the Microsoft version.

Microsoft's initial release will support C and the Macro Assembler languages. While IBM will also support C, assembler and Basic, the firm is said to be discouraging developers from writing in Basic and assembler, developers said.

Some developers said they believe that IBM is pushing C and Fortran, two languages that support the firm's Systems Application Architecture (SAA). Applications written in these languages can be more easily transported to larger systems, thus buttressing IBM's SAA strategy.

"IBM wants to get everyone singing out of the SAA hymnbook and is telling them if they do, everything will be wonderful," one OS/2 developer quipped.

Fee discrepancies

IBM also said it will charge only a $75 handling fee for the tool kit, as long as developers provide written evaluations of their programs' performance in the compatibility box. In contrast, Microsoft charges $3,000 for the MS OS/2 tool kit.

Microsoft officials claimed that IBM can determine what is contained in its tool kit.

"I don't know what IBM is going to give people as a developer's tool kit. They are not contracting a product from us called a 'Developer's Tool Kit'," Microsoft President Shirley said.

Many elements, however, are common to both products. "The kernel is a product that is identical from both companies. But as far as what tools they are providing, I don't know what they are doing," Shirley added.

In addition, Microsoft is supplying IBM with a C compiler and Macro Assembler. Both tools come with debuggers and linkers.

Included in both versions is an application programming interface (API) that allows programs written for both OS/2 and MS-DOS 3.0 and up to run in protected mode without the Presentation Manager.

In a quandary

But one developer said he thinks that applications written using IBM's programming interface, called the Family Application Programmer's Interface, will need to be rewritten in order to work with the Presentation Manager.

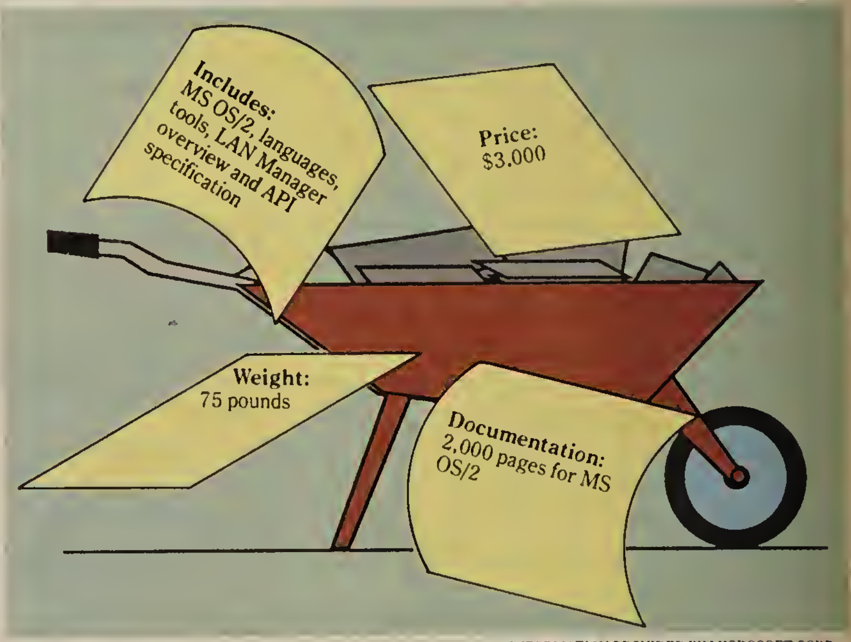
The prospect of having to make a choice about whether or not to write using IBM's Family API has put some developers in a quandary.

> IBM WANTS to get everyone singing out of the SAA hymnbook and is telling them if they do, everything will be wonderful.

Developers who write to the API now will have to adapt their applications to Presentation Manager later, but they will assure themselves of a time advantage against developers who wait for the Presentation Manager tool kit to ship later this year.

"This [Presentation] is tied to the SAA concept, so IBM is not going to be rushed into anything by their own little micro guys. I don't think you'll see [the final version of the Presentation Manager] until the middle of next year," said one developer who attended the conference.

MS OS/2 developer's tool kit
The first release


Includes: MS OS/2, languages, tools, LAN Manager overview and API specification
Price: $3.000
Weight: 75 pounds
Documentation: 2,000 pages for MS OS/2

INFORMATION PROVIDED BY MICROSOFT CORP.
CW CHART: MITCHELL J. HAYES

Despite the different approaches, both IBM and Microsoft are interested in providing developers with as much detailed information as quickly as possible, as both firms stand to gain from the implementation of OS/2.

For IBM, OS/2 will help it to sell the Personal System/2 series, which IBM claims is optimized for multitasking environments such as OS/2. And for Microsoft, sales of MS OS/2 will result in the firm's collecting hefty royalties.

Anxious to learn more

Corporate developers are anxious to learn more about OS/2 because they want to both implement and develop software for internal use.

"There is certainly more interest [among corporate developers] than there was in the MS-DOS world. OS/2 gives the corporate developer a lot more flexibility," Shirley said.

OS/2's multitasking and 16M bytes of address space should allow corporate developers to create applications that will bring PCs more into the mainstream of corporate computing environments.

According to Microsoft's Ballmer, one-third of the attendees of Microsoft's MS OS/2 developers conference being held in Seattle this week are corporate developers.

Third-party developers are also anxious to start working with OS/2.

"We knew people wanted the product badly," Shirley said. In fact, timing may be crucial for developers hoping to compete in what will prove to be a fierce new market.

In other news, IBM has informed its dealers that it will ship the PS/2 Model 80, its Intel Corp. 80386-based machine, this month, a full month earlier than expected.

The Intel 80286-based IBM PS/2 Model 60 will also ship this month, IBM said.

SYSOUT Management Made Easy With $AVRS

UNTIL NOW there has not been an integrated approach to the management and archival of SYSOUT and SYSLOG. $AVRS, from Software Engineering of America, solves this problem by completely automating the management and storage of this critical JES output.

$AVRS features and benefits:

- ☑ **ability to capture and distribute all types and sizes of reports and listings**
- ☑ **savings in printer and paper costs**
- ☑ **savings in personnel costs**
- ☑ **comprehensive production and test JCL error checking**
- ☑ **immediate access to JCL of failing jobs through any terminal**
- ☑ **complete ISPF interactive and batch retrieval facilities**
- ☑ **archival and retrieval of SYSOUT by class, name, time, etc.**
- ☑ **increased data center security**

$AVRS is saving thousands of dollars daily at over 750 data centers by providing efficient and cost effective management and archival of SYSOUT and SYSLOG.

To obtain further information on how
$AVRS can benefit your installation, call
SOFTWARE ENGINEERING OF AMERICA at (516) 328-7000.

SOFTWARE ENGINEERING OF AMERICA SEA

Realia strengthens Cobol PC compiler

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Realia, Inc., developer of a personal computer compiler that is fully compatible with IBM's mainframe VS Cobol, is set to release this week its first major revision of the product in two years.

Enhancements to the Realia Cobol compiler include higher execution speeds, special features for users of IBM PC-DOS 2.1 or higher and improved screen-handling features for scrolling, autowrap and color. Realia Cobol is used primarily to develop and debug mainframe Cobol applications on IBM Personal Computers. The company claims to be shipping 400 copies of the compiler per month but will not reveal its total installed base.

At the same time, Realia is expected to announce an informal relationship with Belmont, Calif.-based Oracle Corp., which recently decided to market a Realia Cobol precompiler. The Oracle precompiler will allow programmers to embed IBM SQL statements in Realia Cobol applications, said Marc Sokol, executive vice-president of Realia. That makes the Realia Cobol product available to support Oracle's SQL-based data base management system software for IBM PCs and Personal System/2s. "Both Oracle and Realia expect to sell more products through this relationship, but it is not a formal relationship," Sokol explained.

Rapid screen painting

Realia Cobol 3.0 uses memory-mapped video features to paint screens up to 30 times faster than Realia 2.0. The screen controls may also be written to PC-DOS or ROM BIOS specifications, although displays will be painted at slightly slower speeds.

Another innovation is the revocation of the 20-file limit for open files under PC-DOS 2.1 and later versions of PC-DOS. Now, users can define the maximum number of files as part of the system start-up routine, Sokol said. Up to 255 open files can be supported.

New features include Realdiff, which compares two source files, an expanded version of Rcopy that allows recovery of a damaged index file and Realia Editor, which allows users to correct syntax errors quickly by merging error messages with the source code. The new release is compatible with recent extensions to both ANSI and IBM VS Cobol, Realia said. The compiler conforms to the ANSI Cobol 85 standard but has not yet been submitted for certification, Sokol said.

Realia Cobol 3.0 is available at no additional charge to current Realia Cobol users under maintenance, which costs $120 per year. The Realia Cobol product is priced at $995 for new users.

Ashton-Tate revamps plan

BY DOUGLAS BARNEY
CW STAFF

TORRANCE, Calif. — In an effort to make its slow-selling "pay for support" program more appealing, Ashton-Tate has completely revamped the offering and will now sell support in an unbundled fashion, according to the company.

The initial Ashton-Tate plan, announced nine months ago, was the first pay for support program offered by a major microcomputer vendor and was patterned after support programs for mainframes and minicomputers.

Users, however, balked at paying for the support that many said they felt should come free with the package. After a 90-day grace period, Ashton-Tate cut off support for users who did not sign up for the program, which included offerings for corporations as well as individuals. Ashton-Tate does, however, provide 90 days of free support for each new package, a policy that was designed to help new users get adjusted to the software.

Under the original program, corporate support cost $4,000 per site per year, a price that many users said they felt was out of line. The comprehensive program provided a dedicated corporate service representative, toll-free phone support, a prereview of new products and discounts on courseware, publications and seminars.

Also, the original pay for support program announced by Ashton-Tate did not lower the price of software for volume purchases and did not provide limited liability for software piracy. Ashton-Tate still does not offer site licenses or sell direct, except for its support offerings.

With the new program, corporate support starts at $450 and provides toll-free access with unlimited calls routed through two individuals within the participating firm. For $925, the user firm gets a dedicated Ashton-Tate support representative. "It was a pioneering program. We wanted to announce it, get the program in effect, listen to customers and refine it," said Luther Nussbaum, president of Ashton-Tate. "We are in a refinement point at this time."

TAKE A LOOK INTO
YOUR VTAM NETWORK
The best way to increase power is to increase productivity. Our portfolio of Software Solutions will allow you to increase your systems productivity, your users effectiveness, and the power of your VTAM network.

MULTSESS, today's most efficient multiple session manager, eliminates repetitive logons/logoffs, and provides a more friendly view of the complex online environment.

And now, this Solution just got better!!

ANNOUNCING . . .
MULTSESS 2.7
We are proud to announce the new features and enhancements of Version 2.7 and ask you to TRY US.

Look what we've added.
- Truly dynamic panel mode
- Convenient user exit points
- Application messaging
- Network response monitor
- Application screen print facility
- MVS/XA support

Better than before, MULTSESS:
SOLVES ACCESS PROBLEMS
- Supports 255 concurrent sessions per user
- Allows "Jump Key" session switching
- Permits session portability

PROMOTES FLEXIBILITY
- Dynamically builds custom panels
- Supports full cross-domain communication

FACILITATES CONTROL
- Interfaces to major security packages
- Eases HELP DESK support

All these features are available whether you have just a few or MANY users that require them!

So as you look into your VTAM network, and you consider a session manager, STOP. Give us a call. We'll be glad to send you a free, no obligation trial.

You can be sure...if it's Westinghouse

(800) 348-3523
(412) 256-2900 in PA

Westinghouse Electric Corporation
Management Systems Software
P.O. Box 2728
Pittsburgh, PA 15230-2728

Westinghouse
SOFTWARE **SOLUTIONS**

GET HALF-A-COMPUTER FREE WITH ORACLE VERSION 5

With ORACLE version 5, you save half the computer you thought you needed in order to "go relational"... some benchmarks indicate you save even more.

WHY IS VERSION 5 OF ORACLE SO FAST ON MAINFRAMES, ON MINIS AND ON MICROS?

☐ REASON #1: AI OPTIMIZES QUERY PROCESSING.

V5 applies artificial intelligence to SQL query optimization. For example, few DBMSs can optimize the query "Select accounts 90-days overdue **and** accounts over $10,000." But only ORACLE can optimize "Select accounts 90-days overdue **or** accounts over $10,000."

☐ REASON #2: ARRAY PROCESSING OPTIMIZES ACCESS TO LARGE SETS OF DATA.

Relational DBMSs have always dealt with **logical** sets of data. But they manipulated only one **physical** record at a time. V5 eliminates overhead by physically delivering arrays of hundreds, even thousands, of records at a time.

☐ REASON #3: PARALLEL-PROCESSING OPTIMIZES COMPUTER RESOURCE USAGE.

V5 is 100% re-entrant shared code, and ORACLE'S parallel-processing architecture fully exploits modern dyadic and quadratic processors from IBM, and other multi-processing computers such as those from DEC and Stratus. So ORACLE uses all the MIPS in parallel-processor configurations.

☐ REASON #4: MULTI-TABLE CLUSTERING OPTIMIZES JOINS.

ORACLE stores data from different tables on the same physical disk page. This technique—called *multi-table clustering*—permits you to access data from multiple tables in one disk read operation. Clustering improves ORACLE performance on all multi-table operations, such as join queries, update transactions, etc.

☐ REASON #5: HIGH-SPEED RELATIONAL SORT FACILITY OPTIMIZES DATA AGGREGATION

Ad hoc relational queries frequently request that data be grouped, ordered or otherwise sorted. V5's internal sort facility performs aggregation and elimination early, faster than previously thought possible.

☐ REASON #6: EFFICIENT ROW-LEVEL LOCKING OPTIMIZES TRANSACTION THRUPUT.

Row-level locking and a read-consistency model optimizes ORACLE V5 transaction concurrency. For the first time, high transaction thruput is achieved by a fully relational DBMS.

THE ULTIMATE REASON

Oracle introduced the first relational DBMS and the first implementation of SQL back in 1979. Today ORACLE is installed on thousands of minis and mainframes, and over ten-thousand PCs. ORACLE is the only SQL-*compatible* relational DBMS that's *portable* across IBM mainframes, DEC, DG, HP and most other vendors' minis and micros, including the IBM PC. And ORACLE applications and databases are *connectable* across different hardware and operating system, providing you with a true distributed solution to your information needs.

Spend half a day at an Oracle seminar in your city, and find out how you can have the benefits of a portable, DB2-compatible relational DBMS... and save half a computer. Call our national seminar coordinator at 1-800-345-DBMS. Or write **Oracle** Corporation, Dept. V5, 20 Davis Drive, Belmont, CA 94002.

U.S. SEMINARS

AK	Anchorage	Apr 14
AL	Birmingham	May 12
AR	Little Rock	May 12
AZ	Phoenix	Apr 15, Jun 3
	Tucson	Jun 30
CA	Concord	Jun 10
	Los Angeles	Apr 7, May 12, Jun 16
	Newport Beach	May 5
	Pleasanton	Apr 8
	Sacramento	May 5
	San Diego	May 14
	San Francisco	Apr 9, May 7, Jun 16
	San Jose	Apr 30, Jun 18
CO	Colorado Springs	Apr 21
	Denver	Apr 16, May 5, Jun 25
CT	Hartford (Farm.)	May 5
DE	Wilmington	May 5
FL	Tampa	Apr 8
GA	Atlanta	May 6
IA	Des Moines	Apr 15, Jun 17
ID	Boise	Jun 4
IL	Chicago	Apr 9, May 14, Jun 11
	Springfield	May 7
IN	Indianapolis	Apr 22, May 20, Jun 25
KS	Wichita	Apr 2
KY	Louisville	Apr 8
LA	New Orleans	Apr 15, Jun 26
MA	Boston	Apr 15, May 14, Jun 10
	Springfield	Apr 9
MD	Baltimore	Apr 2, Jun 24
	Bethesda	Apr 7, Apr 15, Apr 21, May 5, May 13, May 19, Jun 4, Jun 10, Jun 18
ME	Portland	Apr 22
MI	Detroit	Apr 7, May 12, Jun 9
	Grand Rapids	Apr 9
MN	Minneapolis	Apr 23, May 13, Jun 30
MO	Kansas City	Apr 9, Jun 9
	St. Louis	Apr 14, May 12, Jun 16
NE	Omaha	Jun 2
NJ	Iselin	Apr 1, Apr 15, Apr 29, May 13, May 19, Jun 11, Jun 25
NM	Albuquerque	Apr 30
NV	Las Vegas	Apr 1
NY	Albany	Apr 23, Jun 17
	Buffalo	Apr 8
	New York City	Apr 8, Apr 16, Apr 22, May 6, May 14, May 21, Jun 16, Jun 24
	Rochester	Apr 16, May 14, Jun 11
OH	Cincinnati	Apr 22, Jun 17
	Cleveland	Apr 1, May 5, Jun 2
	Columbus	Apr 2, May 6, Jun 3
	Dayton	Apr 21, Jun 16
OK	Oklahoma City	Apr 7, May 29
	Tulsa	Jun 16
OR	Portland	May 7
PA	Allentown	Apr 21
	Harrisburg	May 6, Jun 17
	King of Prussia	Apr 23
	Philadelphia	Apr 9, May 7, Jun 11
	Trevose	Jun 30
SC	Columbia	Apr 7
TN	Nashville	Apr 9
TX	Amarillo	Apr 7
	Austin	Apr 1, Jun 11
	Dallas/Ft. Worth	Apr 14, May 5, Jun 9
	Houston	Apr 9, May 7
	San Antonio	Apr 2, Jun 10
UT	Salt Lake City	Apr 29, Jun 18
VT	Burlington	May 6
WA	Seattle	Apr 7, May 12, Jun 24
WI	Madison	Jun 23
	Milwaukee	Apr 29, Jun 9
WV	Charleston	Apr 15

CANADIAN SEMINARS

Calgary	May 19
Edmonton	Apr 14
Hamilton	Apr 21, May 19, Jun 16
London	Apr 28, May 26
Ottawa	Apr 2, May 7, Jun 4
Regina	Jun 16
Saskatoon	Jun 9
Toronto	Apr 7, May 12, Jun 9
Vancouver	May 14
Victoria	Apr 21
Winnipeg	May 5

ORACLE®

COMPATIBILITY • PORTABILITY • CONNECTABILITY

Call (800) 345-DBMS today.

Ottawa (613) 238-2381 ☐ Quebec (514) 337-0755 ☐ Toronto (416) 362-3275
ORACLE-U.K. (SURREY) 44-1-948-6976 ☐ ORACLE-EUROPE (NAARDEN, THE NETHERLANDS) 31-2159-49344

©1986 by Oracle Corporation. ORACLE® is a registered trademark of Oracle Corporation. SQL/DS, DB2 and IBM are registered trademarks of IBM. DEC, DG, AT&T, Stratus, HP and Bell Laboratories own numerous registered trademarks. TRBA

3Com, Microsoft edge closer

Two firms reportedly honing development of LAN Manager

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — Reports that 3Com Corp. and Microsoft Corp. will shortly announce an agreement under which 3Com will help write part of Microsoft's LAN Manager, an enhanced version of the Microsoft Network, or MS-Net, protocols, circulated among financial investors last week.

"We heard 3Com was going to announce next week that they are finishing the development of the LAN Manager," said Tom White, president of the Consulting Services Group of The Seybold Group in San Jose, Calif.

Mark Tebbe, a consultant and president of Lante Corp. in Chicago, said he had heard the same reports.

Robert Bressler, who heads 3Com's Software Division, declined to confirm or deny the reports. But he did concede that 3Com has the capability to help Microsoft out. "It's fair to say that in the process of talking to them about licensing [MS OS/2 and the LAN Manager], we have explored possible ways of working together," Bressler said.

Teams from Microsoft and 3Com have spent the last six weeks working together on MS OS/2 and the LAN Manager, according to 3Com Chairman Robert Metcalfe.

"3Com has already helped us a lot," said Steve Ballmer, Microsoft's vice-president of system software.

However, he refused to comment on reports of a pending development agreement between the two firms.

Partnership a natural

A 3Com-Microsoft partnership on the LAN Manager is a natural, according to industry watchers.

Reports of a pending announcement picked up so much steam that they drove the price of 3Com's stock up last week, according to Rich Kimball, an analyst with Montgomery Securities in San Francisco.

On Wednesday, the stock went up 1¼ points to $19 per share following heavy trading of more than one million shares. Trading subsided somewhat Thursday as the stock edged up another ⅜ of a point.

Running out of time

Microsoft is running out of time in its bid to dominate the network operating system market, according to Tebbe. He noted that meetings between 3Com and Microsoft have involved more than just technical engineers.

For example, meetings have included Metcalfe, 3Com President William Krause and Howard Charney, a 3Com vice-president and cofounder, along with Microsoft's Ballmer.

Also, 3Com and Microsoft are close to ironing out the details of an agreement allowing 3Com to license MS OS/2 to run on the 3Server3 file server, Bressler said.

3Com is already an OEM for Microsoft's MS-Net and was the first to announce plans to license MS OS/2 and the LAN Manager.

This pie was shaped by a micro, filled by a mini and sliced by a mainframe.

All running the same software.

Impressionist™ graphics software. The only graphics software that's at home in any environment — micro, mini or mainframe. So everyone in your company has access to the same great business graphics, with the same menus and commands no matter where Impressionist is running.

Impressionist lets you minimize your company's investment in software, training and support. And it makes *your* life easier. Users throughout your company use a single set of functions and menus.

Best of all, data from your host can be shared throughout your company.

And Impressionist is the only graphics package to effectively combine general graphics features with a sophisticated editor and a built-in chartbook. It can even access data from ASCII files and Lotus™ 1-2-3™. So Impressionist can not only be *shared* by more, it *does* more too.

To find out how everyone in your company can have a piece of the same pie, call EXECUCOM Systems Corporation at 1-800-531-5038 (in Texas and Canada call Phyllis Shockey at 512-346-4980).

EXECUCOM
Impressionist

Impressionist runs in IBM MVS/TSO, VM/CMS, DEC, PRIME and IBM PC environments.
Impressionist is a trademark of EXECUCOM Systems Corporation. Lotus and 1-2-3 are trademarks of Lotus Development Corporation.

Senate passes privacy bill

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The U.S. Senate recently passed a bill that would establish privacy safeguards for computer-matching programs conducted by federal agencies.

The bill, which has the support of both the Reagan administration and the American Civil Liberties Union, now goes to the House of Representatives, where the House Committee on Government Operations is expected to take it up later this year.

The Senate passed the Computer Matching and Privacy Protection Act of 1987 by a voice vote May 21, shortly after it was endorsed by the Senate's Committee on Governmental Affairs. The bill was sponsored by Sens. William S. Cohen (R-Maine) and Carl Levin (D-Mich.).

In computer-matching programs, agencies cross-check information from two data bases to find individuals common to both. Usually, the matching programs are performed to detect fraud, abuse or overpayments in government programs.

The bill requires federal agencies to adhere to certain safeguards when performing computer-matching programs to ensure that citizens are not harmed by unauthorized use of personal information or knocked out of government benefit programs due to inaccurate data.

The measure prohibits federal or state agencies from curtailing government benefits as the result of computer-matching programs unless the data used in the match is independently verified for accuracy and the individual is notified and has the opportunity to refute the information.

The bill also requires agencies to enter a written agreement spelling out the terms and safeguards for each computer-matching program and establishes a Data Integrity Board at each agency to review, approve and monitor the programs.

Improved file server readied for Macintosh

Appleshare upgrade for Mac II, SE boosts foreground applications, expected in 45 days

BY PATRICIA KEEFE
CW STAFF

CUPERTINO, Calif. — Apple Computer, Inc. reportedly is readying an upgrade to its Appleshare file server optimized to support the company's new Macintoshes and to improve the performance of applications running in the foreground on the server. The upgrade is slated to ship within 45 days.

Although he said Appleshare 1.1 will enhance the performance of foreground applications, Peter Friedman, group manager of Apple's desktop communications group, denied reports that those applications have crashed the original Appleshare network.

Announced in January for the Appletalk network, Appleshare began shipping to dealers in February, according to Friedman.

Needs dedicated Mac, hard disk

Appleshare 1.1 software will require a dedicated Macintosh and a hard disk but allows users to run certain network services optimized for Appleshare in the foreground, the vendor said. For example, Think Technologies, Inc.'s Inbox Version 1.0 electronic mail will not run in the foreground, but Version 2.0 will, Friedman said.

User applications such as word processing and spreadsheets, however, are not supported in the foreground by the software.

Appleshare 1.1 will require the use of either the Macintosh II or the Macintosh SE as a server and will support up to 50 users simultaneously, Friedman said. Release 1.1 also will support the as-yet-unshipped Lasershare and allow the Mac II to be used as a server without an attached monitor. However, users will need a monitor and a keyboard to perform network administration.

The upgrade kit will be free of charge, Friedman said. Installing the upgrade will be similar to installing desk accessories, he added.

Running network services in the foreground of the original version of Appleshare reportedly has caused application collisions, disk crashes and data loss because the memory is not properly partitioned.

"If the server was in the middle of doing something, it could take a while to recover," said Bob Bressler, vice-president and general manager of 3Com Corp.'s Software Division.

Memory, compatibility to blame

The problem lies in both the memory and program compatibility, according to Bressler.

Some of Release 1.1's enhancements appear to be, in part, a response to complaints that a Mac running Appleshare can crash while running foreground applications.

For example, Apple changed the scheduling of Appleshare's algorithm to provide better performance with concurrent applications, Friedman said. "But to my knowledge, it's not a matter of [disks] crashing," he said.

But disk crashes on the original version led some dealers to instruct users to dedicate Appleshare to file sharing only.

"Dealers didn't want to be responsible for telling a customer he could run two applications," Bressler said.

Meanwhile, many users who bought Appleshare did not understand what a dedicated server was until they sat down in front of one, said Andy Seybold, president of The Seybold Group, Inc., a Torrance, Calif.-based research firm. "Then Apple got flack," he said.

No nondedicated version planned

Even so, and despite several reports to the contrary, Apple does not intend to release a nondedicated version of Appleshare, Friedman said. He concurred with complaints from dealers and users that smaller networks might have difficulty in justifying tying up a Mac and a hard disk as a server.

"If you've got three to five people on a network, why pay $5,000 for a Mac and a hard disk as a server? After seven nodes, Appleshare becomes cost-effective — but under five, forget it. It's not feasible," said Joe Kress, a sales representative with Pactel Infosystems in San Leandro, Calif.

A number of dealers said they are steering users who are planning small networks toward alternative third-party products, such as Centram Systems West, Inc.'s Tops network and Infosphere, Inc.'s Macserve server. Tops distributes network resources across the network rather than requiring a dedicated network server.

Nonetheless, Friedman maintained that as a network grows, users will find they have to migrate to a dedicated server. "For intensive information sharing, you need the performance [boost]," he said.

Uptime

Provide 24 Hour CICS Service
IBM gave dynamic allocation to CICS... but you need Netec's CAFC to make non-stop CICS a reality. CAFC allows a single command to OPEN or CLOSE 5 or 50 files. CAFC establishes two way communication between your CICS regions and your batch jobs. Your batch jobs will always have the files they need for processing without operator intervention.

Let LCON manage your MVS Complex
The Logical Console Operator's flexibility and rock steady reliability allow it to schedule and manage your tedious, complex, and repetitive console chores. Everyone wins with faster response time, increased batch throughput, improved on-line service and more uptime.

NETEC
Netec International, Inc.
P.O. Box 18538 • Dallas, Texas 75218
Telex 314419 TELECOM UD (214) 324-2848

IN STOCK NOW...
- DATAPHONE* Data Sets And Multiplexers
- 3270 COMPATIBLE 6500* Multifunction Communication System
- ASYNCHRONOUS CRT's and Printers

*Trademarks of AT&T

Federal Communications Corporation
11126 Shady Trail, Suite 101
Dallas, TX 75229
214/620-0644

AT&T

An Authorized Value Added Distributor of AT&T

TAKE YOUR IBM MAINFRAME ON THE ROAD WITH LOCAL DATA'S TRULYNX/3270.

As a busy executive you are expected to spend a lot of time on the road. And, oftentimes, getting pertinent information to and from your home office can be frustrating.

Now with Local Data's DataLynx/3174 protocol converter and TruLynx/3270 software, you can access or transfer information to your IBM mainframe from a laptop computer or other portable PC's.

Your portable is now a PC 3270 with host compatible file transfer.

TruLynx/3270 allows you to remotely check on customer orders, enter new orders, read and leave messages electronically, update your calendar, and transfer correspondence from anywhere your business may take you.

For more information on how you can easily connect your portable computer to your IBM mainframe, call 213-320-7126. In Canada, call 613-748-9751. And we'll even provide you with a free 30-day trial, just by asking!

LOCAL DATA

2771 Toledo St., Torrance, CA 90503
213-320-7126 FAX 213-618-0386
TELEX 182518

DataLynx and TruLynx are trademarks of Local Data, Inc. IBM is a registered trademark of International Business Machines Corporation.

DEC, Cray plan joint marketing venture

BY JAMES CONNOLLY
CW STAFF

Two vendors whose systems often run side by side in scientific and engineering computing environments, Cray Research, Inc. and Digital Equipment Corp., plan to formalize a relationship this week.

A product, set to be announced this week, that was developed under the pact reportedly lets users connect Cray supercomputers and DEC VAX minicomputers via DEC's high-speed VAXBI bus.

The product, the DEC VAX supercomputer gateway, is slated to be sold by DEC and reportedly makes it easier for VAXs to serve as front-end processors for Cray computers. A Cray official said the gateway, working with Cray's existing VAX/VMS Station software, will provide higher speed communications than are available now. VAX/VMS Station lets Cray customers use DEC commands.

Cray officials said VAXs serve as front-end processors in 30% of approximately 165 Cray sites worldwide.

The announcement reportedly may lead to DEC and Cray salesmen making joint customer calls.

Analysts said the announcement should have little impact on Cray and DEC's revenues.

DEC, which reportedly will collect the profits from the gateway, already has a joint marketing pact with Floating Point Systems, Inc.

Pact differs from Floating Point's

Analyst Hal Feeney, who covers the supercomputer market for the San Jose, Calif.-based market research firm Dataquest, Inc., said the Cray-DEC agreement should have no impact on the Floating Point-DEC agreement because the pacts relate to significantly different markets.

"It appears, from the DEC perspective, to give more completeness to the product line from the desktop up to a Cray," Feeney said.

Myron F. Kerstetter, who specializes in the DEC market for the Stamford, Conn.-based research firm the Gartner Group, Inc., said the product announcement is unlikely to harm minisupercomputer vendors such as Floating Point and Convex Computer Corp. because those systems are priced in the hundreds of thousands of dollars while Cray systems cost a minimum of several million dollars.

Users now linking VAXs and other front-ends to Cray systems tend to use Cray's Front End Interface and products based on Ethernet or technologies such as Network Systems Corp.'s Hyperchannel local-area network.

Robert R. Burns, vice-president of planning for Network Systems, emphasized that Hyperchannel was designed to interconnect a variety of systems, such as those found in a complex Cray installation.

©1987 ADR
"With 40 programmers on-line, ROSCOE still responds in less than half a second. I couldn't ask for anything less."
—Bruce Clauter, Manager, Systems Software
Borden, Inc.

When it comes to programming, time is indeed money. A lot of money. So the surest way to cut the cost of programming is to make it go faster.

That's why thousands of companies like Borden, Inc., the Iowa Power and Light Company and Giant Food Inc. use ADR/ROSCOE.®

Borden's programmers get more work done with ROSCOE because it gives them more time to work with the computer. Forty programmers can work at the same time and still get half second response times.

They speed up the programming process by using ROSCOE's high level procedural language to recreate typical program routines with a single command. And its screen painting facility to generate code automatically.

ROSCOE also helps Borden get more from their computers. Even with 40 programmers, ROSCOE's single address space architecture still uses less than 5% of their CPU. Which has helped them delay expensive hardware upgrades.

And ADR® can help you get the most from ROSCOE with our pre-installation consulting service, training programs and worldwide support network that solves most common problems over the phone.

To learn how ROSCOE can unlock the potential of your people and computers call 1-800-ADR-WARE.

ADR PERFORMANCE SOFTWARE.
Unlock the potential.

ADR
AN AMERITECH COMPANY

Applied Data Research, Inc. Orchard Road & Rt 206, CN-8, Princeton, NJ 08540 1-201-874-9000.

X/Open chief sets strategy

BY PATRICIA KEEFE
CW STAFF

The X/Open Group, a consortium of 11 multinational computer vendors trying to increase the portability of application software via Unix, has given its cause a boost by appointing an officer of /usr/group/ as its chief marketing officer.

Last week, the Europe-based group ratified former Unisoft Corp. Chairman Robert R. Ackerman Jr., 31, as chief marketing officer. He will report to the X/Open board and Chairman Geoff Morris, splitting his time between the U.S. and Europe. Ackerman will work with the vendor, user and independent software vendor communities worldwide to determine market needs and develop appropriate strategies. He has been actively involved with standards organizations during the last three years and is currently executive vice-president of /usr/group/.

In an interview, Ackerman outlined X/Open's strategy for the remainder of the year:

- Increasing its presence and influence in the U.S.
- Releasing the first applications written to X/Open's Common Application Environment (CAE), as specified in the X/Open Portability Guide.
- Expanding the number of participants, which currently includes four U.S. firms: AT&T, Digital Equipment Corp., Hewlett-Packard Co. and Unisys Corp. European members include Compagnie des Machines Bull, Nixdorf Computer AG, Ing. C. Olivetti sPa, Philips Norden AB, Siemens AG, ICL PLC and Ericsson Information Systems.
- Incorporating the entity to speed decision making and improve effectiveness.

X/Open, which appears to avoid mentioning Unix, is trying to gain support for CAE. By overriding barriers to proprietary systems, portable applications under CAE are said to increase choice in software or vendor selection and to protect investments in application software.

Users cutting general trade show attendance

But survey finds MIS managers still interested in traveling to industry-specific confabs

BY JEAN S. BOZMAN
CW STAFF

DALLAS — A survey of more than 400 major end-user sites, released this week by the consulting firm of B. R. Blackmarr and Associates, found that users are planning to attend only half as many trade shows this year as they did in 1985. Users are still interested in traveling to industry shows, the study indicates, but they generally want more product focus than is given by horizontal-market shows like the National Computer Conference.

The study, conducted on behalf of 15 of the computer industry's largest vendors — ranging from IBM to Hewlett-Packard Co. to Lotus Development Corp. — found that the average attendee is planning to travel to just one or two trade shows this year. That figure is down from three or four shows in 1985. "They are willing to travel," said Blackmarr Vice-President Joyce McKee, "but the show in question has to meet their educational requirements."

Only half of the MIS managers questioned said they attend trade shows with any regularity and half of them are attending less frequently. The study found that 50.4% of the users questioned attended one trade show in the last year and 42.9% attended two or three shows. Only 5.6% attended four or five shows, 0.8% attended six to eight, and 0.4% attended nine or more trade shows.

Cost-cutting one cause

The Blackmarr data dovetails with a general trend in trade shows of all types, for which attendance crested in 1981. "Attendance in general has fallen off by 20% since then," said Richard Swandby, president of Exhibit Surveys, Inc. in Red Bank, N.J. Swandby has chronicled the attendance and success of various trade shows since 1963.

"Corporations have cut back on convention and trade show travel. Where they once sent five or 10 people to a show, they now send one or two. It's a result of corporations trying to cut overhead and build up their profitability," Swandby added.

Blackmarr studies have shown that a vendor's absence at a major trade show may not cause much damage from the end-user perspective. "Our survey of 525 end users last year showed that 54% said the absence of a major vendor would not affect the user's opinion of that vendor," McKee said.

With that in mind, some vendors, such as Digital Equipment Corp. and Wang Laboratories, Inc., have decided in recent years to cut costs by dropping out of an NCC show — without anticipating major damage to their market presence. But the point of the surveys is not to kill trade shows; it is to find a useful alternative for the vendors' advertising and marketing dollars, McKee said.

Narrowing the target

Alternatives suggested by Blackmarr include vertical-market trade shows, road shows such as Decworld and permanent exhibits such as Dallas's Infomart and Techmart in San Jose, Calif.

The recent survey rated Decworld the highest among the shows in terms of effectiveness in creating new orders for products, McKee said.

"Decworld ranked 4.4 out of a possible five in this survey," she said. The International Communications Association telecommunications show has also proven to be highly effective for both vendors and end users, Blackmarr studies have shown.

'Neutral ground'

Vendors that have asked Blackmarr to track end-user trends in trade show attendance since 1984 have met during major trade shows such as NCC and the Comdex shows and also at Blackmarr's offices in Dallas. "We represent a kind of neutral ground for these competitors," McKee explained.

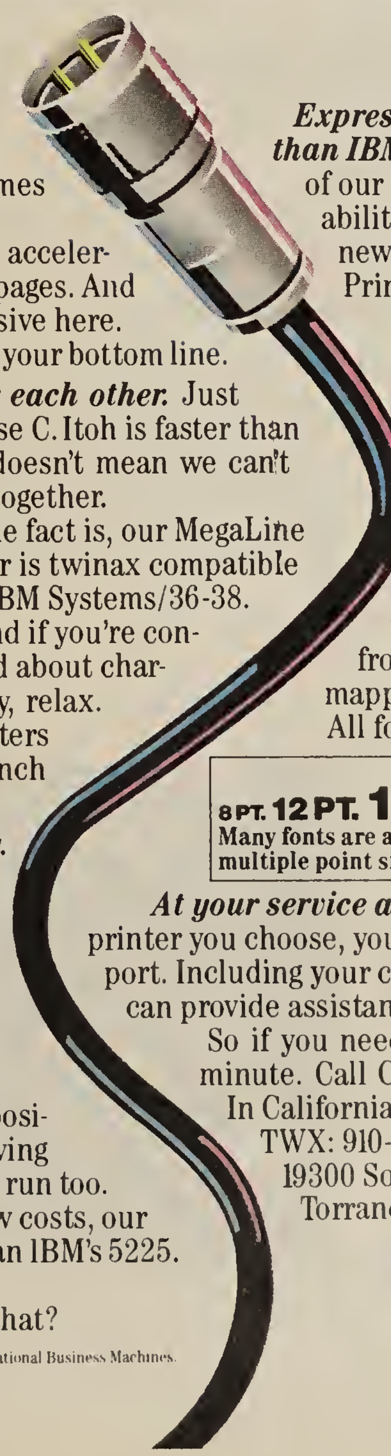
"Vendors are looking for accountability data. They need to go to top management with the data to show them the most effective way to spend their trade show dollars. This kind of study is a tool for the exhibitor to help them focus their own in-house studies on trade show attendance," McKee added.

Cost-effectiveness is key to understanding vendor decisions to drop out of events. The cost of a single 50- by 50-foot booth at a large trade show costs vendors about $500,000, McKee said, and some major vendors tackle more than 80 shows a year. For large vendors like IBM or AT&T, that means an annual budget of $15 million to $25 million for trade shows, including travel and incidental expenses.

In the past, vendors have asked Blackmarr consultants how to prepare for particular shows and what products to bring. After three years of studies, McKee said, vendors now have a better picture of changing end-user requirements.

"Vendors want this kind of study to continue because they want to be able to anticipate what the benefits of attending a trade show will be," she added.

It only takes a minute to prove we're four times faster than IBM.



Give the MegaLine™ Mod 5225 Ion Deposition Printer a minute and it'll give you 1,980 lines. That's four times more than IBM's 5225 can print.

In just one month, MegaLine can accelerate your printing volume to 150,000 pages. And if you think that figure looks impressive here. Wait until you see what it does to your bottom line.

C. Itoh and IBM are made for each other. Just because C. Itoh is faster than IBM, doesn't mean we can't work together.

	IBM 5225	MegaLine Mod 5225
Lines/Min	280-560	2000
Characters/Line	136-198	136-198
Lines/Page	66-88	66-88
Twinax	Yes	Yes
Printer Type	Impact	Non-Impact
Protocol	5225	5225

The fact is, our MegaLine printer is twinax compatible with IBM Systems/36-38.

And if you're concerned about character and line spacing compatibility, relax. MegaLine gives you 10 and 15 characters per inch (cpi), and 6 and 8 lines per inch (lpi). Just like IBM's 5225.

The low cost of high technology. For a high speed, high quality, high print resolution page printer, the MegaLine has remarkably low costs.

Its per-copy cost is less than 2¢.

Its monthly maintenance costs are half what it takes to keep a laser printer going.

And its durable, four-step ion deposition printing process — with few moving parts — means lower costs in the long run too.

Along with its high speed and low costs, our MegaLine has a smaller footprint than IBM's 5225. It's also much quieter.

Now what could be better than that?

© 1987 C. ITOH ELECTRONICS. IBM is a registered trademark of International Business Machines.

Express yourself forty times faster than IBM's 5219. If you want all the features of our MegaLine *plus* electronic forms capability, you can't get any better than the new MegaPro™ Mod 5219 Ion Deposition Printer.

With its unique graphic arts features and proportionally spaced characters, the MegaPro lets you create attractive business forms at a quick 30 pages-per-minute (that's forty times faster than IBM's 5219).

It can manage up to 32 fonts on one page. Store up to six pages of forms at one time. And give you all the tools you need to express yourself — from line drawing and shading to bit-mapped graphics and logos.

All for just 2¢ a page.

8PT. 12PT. 18PT. 24 PT. 30 PT.
Many fonts are available in Regular, Bold and Italics, as well as multiple point sizes.

At your service around-the-clock. No matter which printer you choose, you'll get C. Itoh's complete nationwide support. Including your choice of several on-site service plans that can provide assistance seven days a week, 24 hours a day.

So if you need a faster printer, don't wait another minute. Call C. Itoh toll-free 1-800-843-6143. In California, call 1-800-323-2024. TELEX: 652-451. TWX: 910-343-7446. Or write us at
19300 So. Hamilton Ave., P.O. Box 9116,
Torrance, CA 90508-9116.

C.ITOH
Image Systems Division

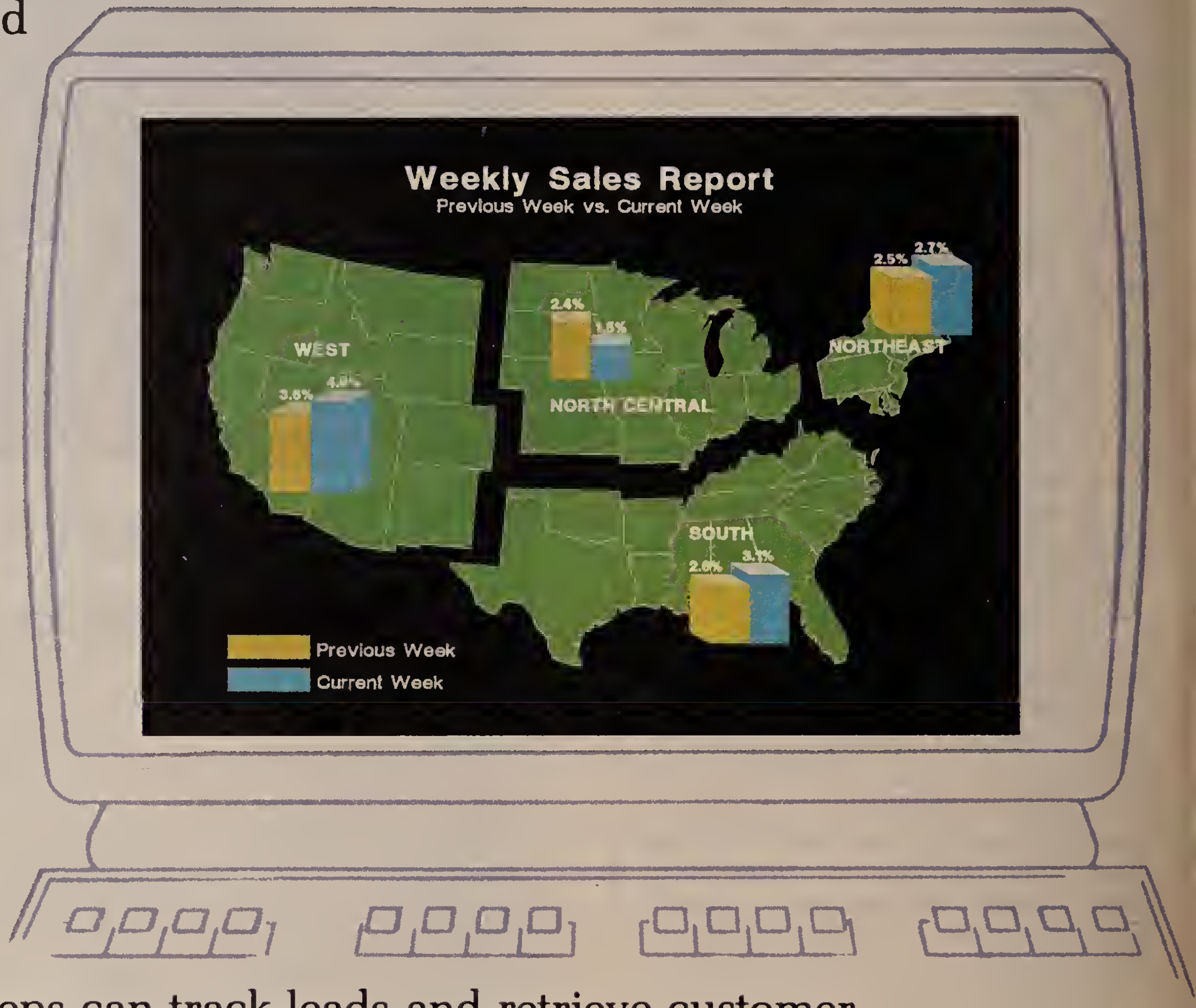
THE SAS®

Fourth Generation Software with a Blueprint for Productivity

To build productivity, you need a solid foundation. It's yours with the SAS System... designed by the leading architect of Information Center software.

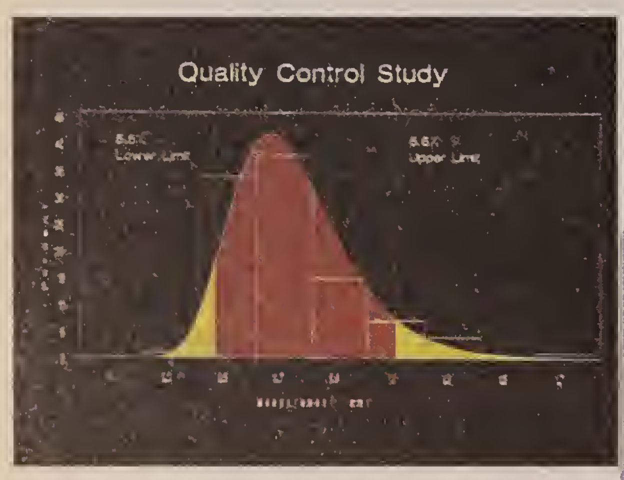
Here, in one system, are integrated tools for any computing task. For any environment, from personal computers to mainframes. For seasoned professionals and new users alike.

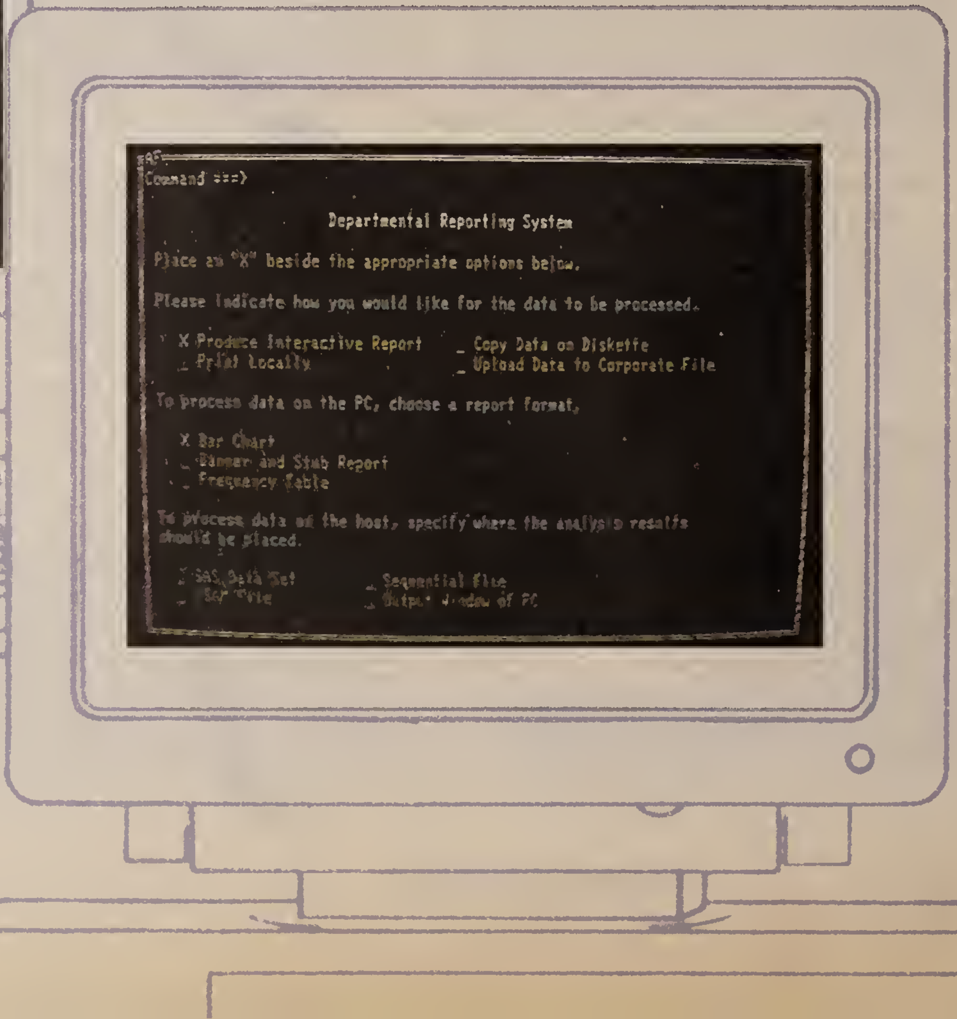
The fourth-generation language has the power you need to handle all your applications—with English-like commands that get the job done rapidly. And you can design user-friendly front-ends to any application. Even new users can run sophisticated jobs, reports, and analyses... just by filling in the blanks!



Do-it-Yourself Applications for Every User. With the SAS System, users get the results they want without placing unnecessary demands on your DP staff. Managers can build forecasts and make "what if" analyses. Sales reps can track leads and retrieve customer information from a variety of data bases. Your clerical staff can produce stacks of "personalized" letters. The menus make it easy...and on-line help is always available.

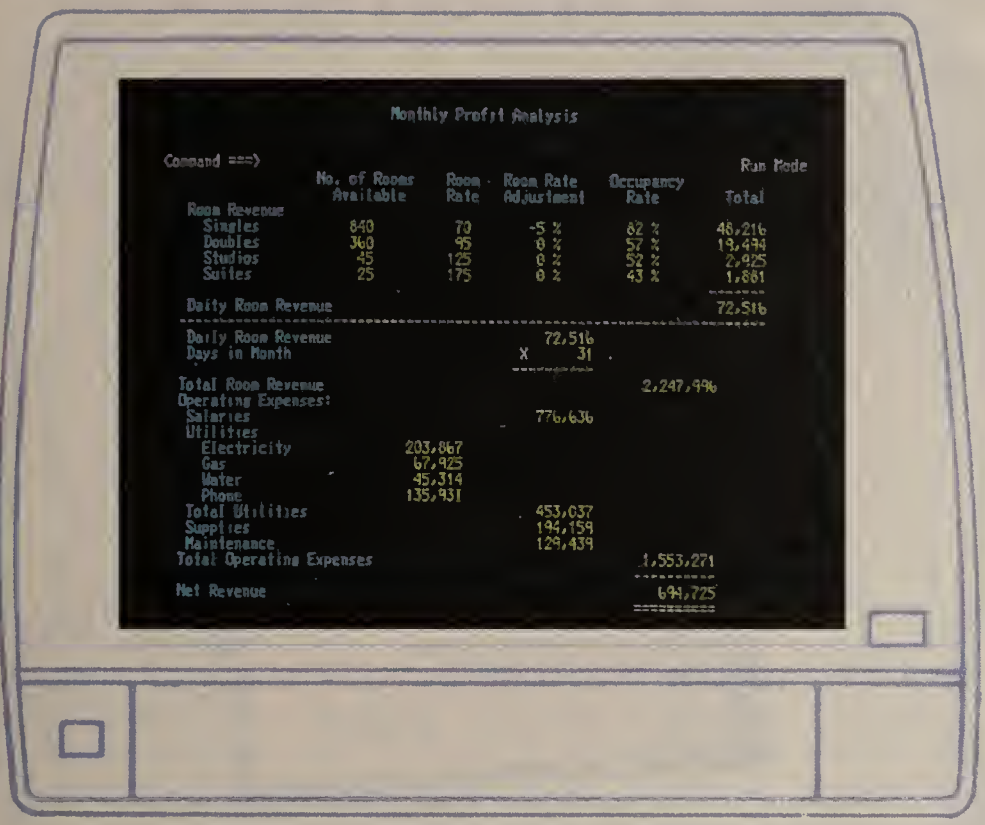
But ease of use shouldn't be confused with lack of power. We eliminated that trade-off by giving programmers everything they need to handle computer performance evaluation, matrix programming, and applications development.





```
Command ===>

                 Departmental Reporting System

Place an "X" beside the appropriate options below.

Please indicate how you would like for the data to be processed.

   X Produce Interactive Report     _ Copy Data on Diskette
   _ Print Locally                  _ Upload Data to Corporate File

To process data on the PC, choose a report format.

   X Bar Chart
   _ Banner and Stub Report
   _ Frequency Table

To process data on the host, specify where the analysis results
should be placed.

   _ SAS Data Set           _ Sequential File
   _ [illegible] File       _ Output Window of PC
```

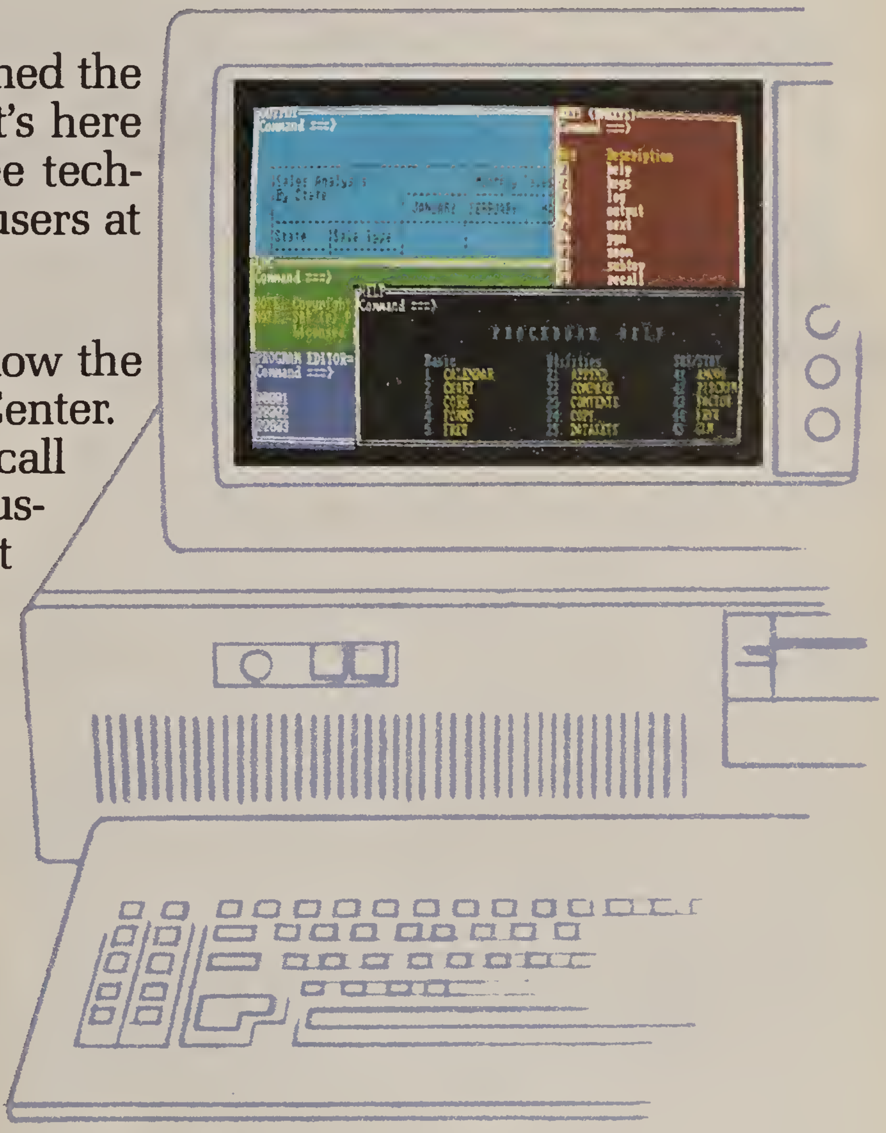
SYSTEM



```
                         Monthly Profit Analysis

Command ===>                                                      Run Mode
                     No. of Rooms   Room   Room Rate   Occupancy
                       Available    Rate   Adjustment    Rate       Total
  Room Revenue
    Singles               840         70      -5 %        82 %      48,216
    Doubles               360         95       0 %        57 %      19,494
    Studios                45        125       0 %        52 %       2,925
    Suites                 25        175       0 %        43 %       1,881
                                                                   -------
  Daily Room Revenue                                                72,516
 -------------------------------------------------------------------------
  Daily Room Revenue                              72,516
  Days in Month                                 X     31
                                                --------
 Total Room Revenue                                         2,247,996
 Operating Expenses:
  Salaries                                       776,636
  Utilities
    Electricity                  203,867
    Gas                           67,925
    Water                         45,314
    Phone                        135,931
  Total Utilities                                453,037
  Supplies                                       194,159
  Maintenance                                    129,439
 Total Operating Expenses                                   1,553,271
                                                            ---------
 Net Revenue                                                  694,725
                                                            =========
```

Ready-to-Use Tools for Every Task. The SAS System brings you more than 125 integrated procedures for data analysis and decision support. Statistical analysis and spreadsheets. Quality control and customized graphs. Project management and much more.

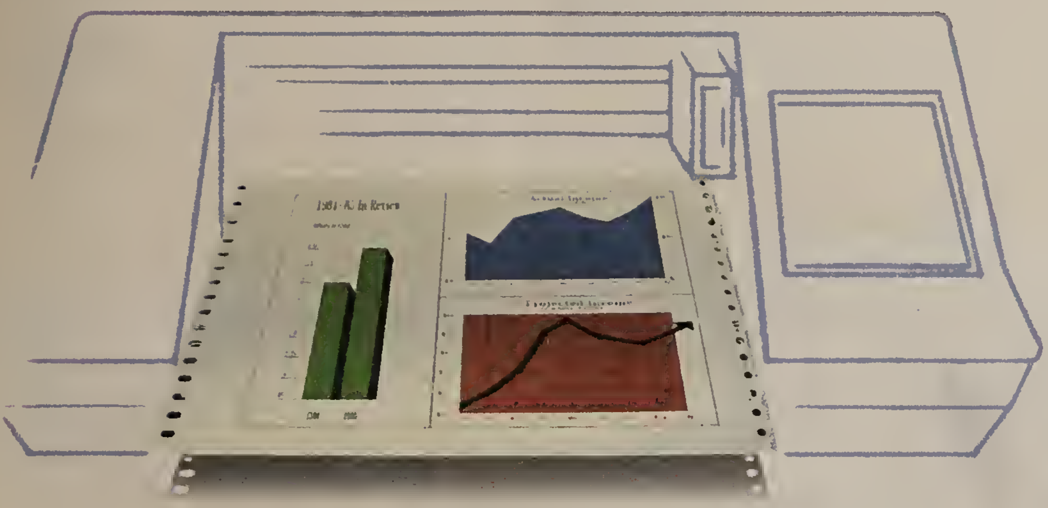
And you can put the SAS System to work where you need it most. The language, syntax, and commands are the same for mainframe, mini, and personal computers. So it's easy to move applications between systems, departments, or company locations.



Built-in Support for Every Site. When we designed the SAS System, we included support at every angle. It's here for you in our complete documentation. In our free technical support. And in our authoritative training for users at all experience levels.

Take a More Detailed Look. See for yourself how the SAS System builds productivity in the Information Center. In the Data Center. On the desktop. Just give us a call for a closer look at the blueprint. International customers, call the International Marketing Department for information on your local distributor.

The SAS System runs on IBM 370/30xx/43xx and compatible machines under OS, TSO, CMS, DOS/VSE, SSX, and ICCF; on Digital Equipment Corp. VAX™ 8600 and 11/7xx series under VMS™; on Prime Computer, Inc. Prime 50 series under PRIMOS®; on Data General Corp. ECLIPSE® MV series under AOS/VS; on IBM AT/370 and XT/370 under VM/PC; and on IBM PC AT and PC XT under PC DOS. Not all products are available for all operating systems.



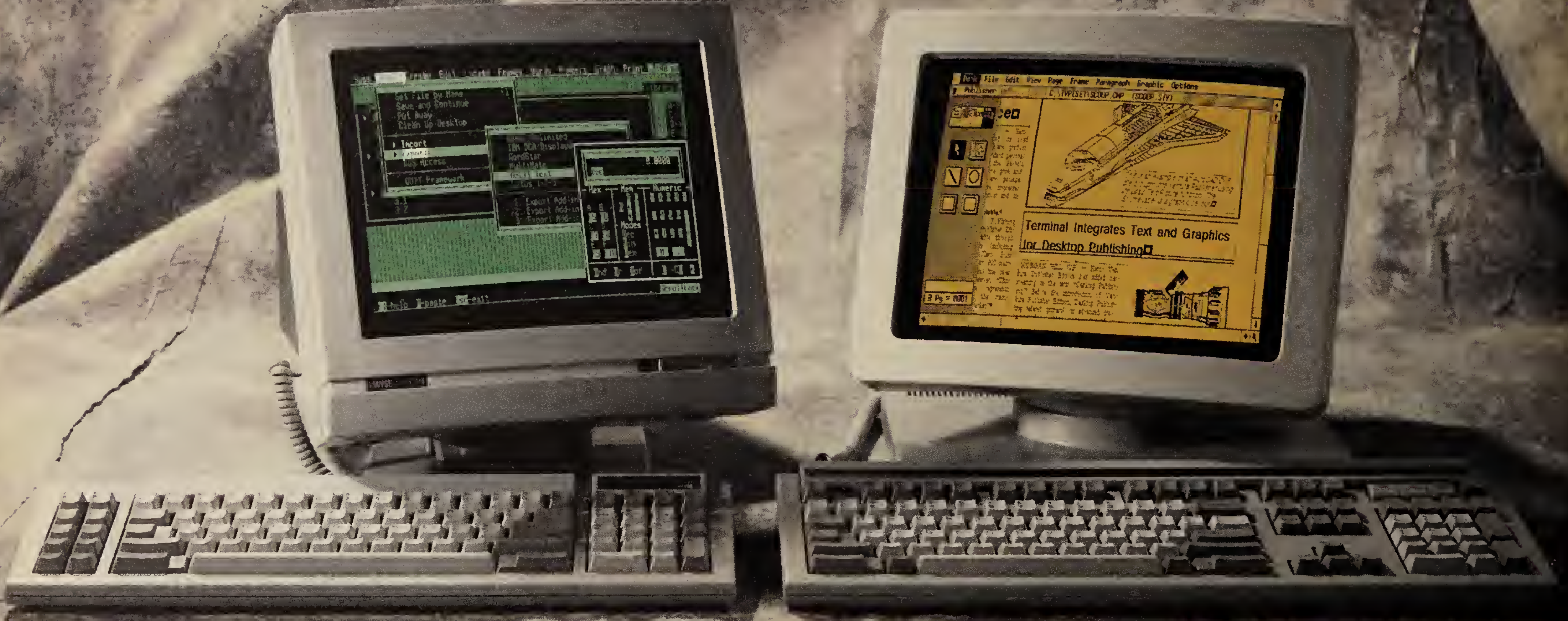
SAS®

SAS Institute Inc.
SAS Circle, Box 8000
Cary, North Carolina
27511-8000, USA
(919) 467-8000, x7000
Telex 802505

SAS is a registered trademark of SAS Institute Inc., Cary, NC, USA. A footnote should accompany the first use of each registered trademark and should state that the referenced trademark is used to identify products or services of SAS Institute Inc. VAX and VMS are trademarks of Digital Equipment Corporation, Maynard, MA. PRIMOS is a registered trademark of Prime Computer, Inc., Natick, MA. ECLIPSE is a registered trademark of Data General Corporation, Westboro, MA.

Copyright © 1986 by SAS Institute Inc. Printed in the U.S.A.

Before you choose between the best PC terminals, read this head-on comparison.



Totally compatible with the IBM AT, right down to keyboard layout. But with a more resilient feel.	Likewise.
14", 132 column, high resolution screen gets more out of programs like Multiplan and Lotus 1-2-3.	Likewise.
Boosts productivity with easy to read character set and advanced ergonomics.	Likewise.
Manufactured, serviced and supported by the company that ships more terminals than anyone but IBM.*	Likewise.
At $599, the Wyse WY-60 delivers unrivaled value if you're looking for sharp resolution, advanced features and superior overall quality in an AT-compatible alphanumeric terminal.	At $649, the Wyse WY-99GT delivers likewise in a graphics terminal, with Hercules and IBM CGA compatibility.

So if you're looking for the best terminal to turn your AT into a multi-user system, there's really no choice like Wyse. For more information, call 1-800-GET-WYSE.

WYSE

We make it better, or we just don't make it.

Trademarks/Owners: Wyse, WY-60, WY-99GT/Wyse Technology; IBM AT, IBM CGA/International Business Machines; Hercules/Hercules; Lotus 1-2-3/Lotus Development Corporation; [illegible]/Microsoft. *IDC 1986 U.S. Terminal Census.

Users wound up over wiring questions

Ultrafast data, teleconferencing threaten to render buildings' cabling schemes obsolete

BY DONNA RAIMONDI
CW STAFF

Users are agonizing over cabling decisions while analysts warn that the twisted-pair wiring present in most corporate buildings today is not reliable enough for increasingly larger computer networks and higher data rates.

"Analysts say, 'Use shielded wire,' but who knows what we will need in a few years?" questions a networking consultant in one large Boston-area insurance company.

Conflicting departmental and functional needs cloud the issue as to whether the company needs shielded, unshielded or fiber cables, says the insurance company consultant, who asked to remain anonymous. "One part of my division uses IBM's Token-Ring networks that run on unshielded twisted-pair. Another part uses Ethernet on coaxial cable. We want to implement teleconferencing and don't know if we can do that on twisted-pair wiring. A fiber backbone makes a lot of sense, but it's expensive, and I don't know if we will really need it," he says.

Trying to keep up

Even if buildings were wired today with shielded twisted-pair wiring that production local-area networks (LAN) can run on, the faster data speeds of host-to-host and peer-to-peer communications — machines talking to each other at machine speed — will make even that shielded scheme obsolete in the next two or three years, says James Bryce, an Austin, Texas, independent networking consultant.

"Currently, there is a specification called the FDDI [ANSI-standard Fiber Distributed Data Interface] for 100M bit/sec. transmission, which is a fiber-optic token-passing ring. That kind of data rate is going to be common in the equipment we will be using in another couple of years," Bryce says.

LANs will be the dominant local connectivity architecture for the next few years, says Larry DeBoever, a consultant and vice-president of Digital Consulting, Inc. in Acton, Mass. "LANs will use primarily twisted-pair wiring, but it will not be the wire currently installed in most businesses," he said at a recent Digital Consulting symposium in Boston. The installed wire, while flexible, cheap and easy to move around, carries the least amount of data, is vulnerable to the elements and electromagnetic interference and has a low rate of data transmission.

Traffic will be far beyond what can be put on twisted-pair wiring even if it is new, Bryce says. "There are laws of physics that catch up with you on that kind of wire. Those laws are not going to be overcome by the vendors telling you today that twisted-pair is enough," he says.

> "THERE ARE laws of physics that catch up with you on that kind of [twisted-pair] wire. Those laws are not going to be overcome by the vendors telling you today that twisted-pair is enough."
>
> JAMES BRYCE
> NETWORKING CONSULTANT

But vendors and users insist that telephone wiring is enough. The Flying Tigers Line, Inc. commercial airlines, headquartered in Los Angeles, is considering three options to modernize its telephone and data wiring. All of the options — a Rolm Corp. proposal that calls for rewiring the building, a David Systems, Inc. proposal that calls for using existing wire with David Systems' network manager and an in-house option to rewire — include installing unshielded twisted-pair wiring, says Karen Bollow, Flying Tigers' director of information management. Flying Tigers, a 17-year-old complex located at the Los Angeles International Airport, is looking at replacing the current phone system and incorporating microcomputer networking as well as connectivity to the host, Bollow says.

"We certainly wouldn't use unshielded twisted-pair for host-to-host communications, but for terminal-to-host or for personal computer LANs, it will be OK," Bollow says. The cost of rewiring, even with a simple unshielded twisted-pair wiring scheme, will run from $500,000 to more than $1 million, she says. Flying Tigers' headquarters has 1,000 phone lines.

For the Boston insurance company, a new building is in the near future. "There is a lot of ambivalence about how to wire it," the networking consultant says. "Your neck is in the guillotine making this decision, because someone could make a breakthrough that allows you to continue using unshielded twisted-pair forever — after you have just installed a very expensive fiber cable." Whichever cabling technology the firm uses will be obsolete as soon as it is installed, he contends.

Companies whose main wiring consideration is to keep costs down would do well to go with AT&T's wiring scheme, an unshielded twisted-pair wire that would limit the growth of large or high-speed networks but handle 1M to 4M bit/sec. data transfer over short distances, says Leo Pepper, an independant consultant at RCK Services Ltd. in Markam, Ont. That is not the wire that is running through the building already, however. Unless the building has been wired within the past two years, most of it will have to be taken out, he adds.

"If you are using data-transfer speeds of 1M or 4M bits and staying within 300 feet of a wiring closet, you are probably fine for a couple of years," Pepper says.

Heeding surroundings

Users must pay attention to the environment, however. If there is external electromagnetic or radio-frequency interference, the system will be affected. Factories, for instance, cannot function with unshielded twisted-pair wiring.

For firms that want to be wired for any eventuality, an IBM-type scheme would work well, Pepper says. "The ideal is to go with shielded wiring for data terminals and unshielded wiring for the telephone set," he says. Shielded twisted-pair wiring, while less vulnerable to noise interference and elements like lightning than plain twisted-pair wiring, still has low bandwidth. "Then look to either an Ethernet coaxial cable or a fiber-optic network for your vertical risers" [between floor wiring], he adds. Smaller buildings — up to four floors — may not require the fiber component.

But that scheme will not take users past five years or so, Bryce says. "IBM's specifications will work with the 16M-bit [data transfer] range they are coming up with, but it is not going to be pushed up to 40M, 50M or 100M bits. The medium can't carry it," he says. The only medium that can carry those rates is fiber-optic cable, Bryce adds.

It is hard to tell someone to go out and put in fiber-optic cable, however, and not be able to tell him for sure what the specifications for the fiber-optic cable are, Bryce says.

And making cabling choices is not cheap. Wiring for terminals costs about $300 per workstation, more if shielded twisted-pair wiring or fiber-optic cable is used. According to Pepper, cabling installation costs break down into the following percentages: site survey and cable system design — 15%, installation labor — 45%, materials — 25%, documentation and testing — 15%.

The fiber-optic cable carries some problems. "There is not a successful connector available where I can just take my workstation and plug it into the wall, the way you can with a standard telephone jack," Pepper says. And while the cost of the fiber-optic cable itself may be the same as coaxial cable in some instances, it is expensive to convert electrical signals to optical signals and back to electrical signals again, Bryce says.

You can't develop tomorrow's applications in yesterday's languages.

The National University School of Computer Science conducts one of the few master's level software engineering programs using Ada. Enrollment is limited. To find out more about this important and prestigious program, call or write Dean Peter Sibley at University Park, Bldg. 4141, San Diego, CA 92108, (619) 563-7128.

The future is software engineering with Ada.

Changing the Course of Education
National University

San Diego • Vista • Orange County • Los Angeles • Sacramento

Accredited by the Western Association of Schools and Colleges
National University does not discriminate in any of it s policys, procedures or practices on the basis of race, color national or ethnic origin religion age,sex handicap or veteran status

LEARN FROM THE EXPERTS

Seminars of Excellence

THE JAMES MARTIN SEMINARS
The Revolution in I.S. Tools & Techniques

James Martin
Toronto November 2-6, 1987
New York November 30–December 4, 1987
Orlando December 7-11, 1987

RELATIONAL DATA BASES:
Practical Applications with emphasis on DB2, SQL, ORACLE and INGRES

Shaku Atre
Washington, D.C. • August 26-28, 1987
Acquire a thorough understanding of the major issues regarding relational data base management systems and get current on the newest and most effective systems, organizational strategies and planning tools.

SOFTWARE RE-ENGINEERING:
A Cost-Effective Strategy for Existing Systems

Eric Bush • Daniel J. Sullivan
New York • September 28-30, 1987
COBOL maintenance problem? Learn the technology, tools and methods that have been proven to reduce maintenance costs by up to 50 percent.

PC LANs:
What You Really Need to Know

David L. Ferris
Chicago • August 31–September 2, 1987
Learn what you really need to know about networking PCs within a departmental or work group environment. This seminar is a PRACTICAL GUIDE on what is achievable today, the financial and staffing resources required, and how to plan, install and operate a LAN.

REGISTRATION IS LIMITED!
To register or request a detailed course catalog call:
(213) 394-8305 Ext. 200

Technology Transfer Institute
Computer Seminars of Excellence
741 Tenth Street
Santa Monica, CA 90402-2899

EDITORIAL

Issue of choice

In the skirmish being waged between Digital Equipment Corp. — a.k.a. Ken Olsen — and the MAP/TOP Users Group, factory users need to train their eyes beyond the smoke of battle and see the issues as they really are.

The fight erupted a couple of months ago when Olsen asked of the lumbering Manufacturing Automation Protocol (MAP) development, "Why do we need another network?" Olsen thus implied that DEC's proprietary Decnet is a manufacturing panacea of sorts.

Big hitters in the users group lashed out at Olsen and DEC, calling them arrogant and self-serving. Olsen has always believed his products are superior to anything else on the market. And as far as factory automation products go, he's at least partially right about Decnet. At least, as DEC's marketing pitch goes, it's available, while Version 3.0 of MAP is a good year to 18 months away.

For companies like DEC, the stakes in the automation game are enormous. The value of manufacturing output in the U.S. will soar in the next decade, with growth derived from weighty capital investments in factory automation. A recent survey of New England-based manufacturers found that while manufacturers are planning little aggressive technology investment in the next year, 300 firms plan to lay out some $14 billion on various technologies in the coming decade.

So let's not fault Olsen for his arrogance or for some pretty shrewd marketing and public relations on his part. Focus instead on the issue, which for factory users should be one of choice — and here is where the outcry from the users group is confusing.

MAP grew from a decision to have the users drive product development within the vendor community. Now some of the MAP devotees are acting like the vendors they sought to direct — categorically rejecting another solution when, in fact, a multisolution environment may ultimately prevail. Decnet or other proprietary solutions may work just fine in certain applications, perhaps even better than whatever MAP finally reveals. But Decnet isn't the best solution for everyone, and it is likely MAP won't be either.

The No. 1 technology issue in the manufacturing community is integration, or multivendor connectivity and compatibility. With factory communications standards in an embryonic state, it is clear why relatively little investment is planned by users in the near future.

As an automation leader, DEC needs to act responsibly in addressing user concerns head-on and not with a lot of marketing hype. After helping start the battle, why didn't Olsen attend last month's MAP/TOP Users Group meeting?

And as for the users group: If DEC thinks it has the superior solution to their needs, let DEC prove it. If there are a lot of people on the fence regarding MAP, don't blame a vendor for trying to tip them to its side. Just become as self-serving and determined, and everyone will ultimately benefit.

WHAT IS IT, RADAR-ANOTHER CASE OF SPAM FOR THE MESSTENT?
NOTHING QUITE THAT POPULAR, SIR.
©RKHTENNANT COMPUTERWORLD
PC XT/286

LETTERS TO THE EDITOR

Not for everyone

The Gartner Group, Inc.'s Michael Braude has generously — albeit didactically and pontifically — promulgated his personal set of seven distributed data base standards to the rest of us [CW, April 27]. These standards read like an owner's manual for a car without brakes.

True, his vehicle for grading distributed data base products has a gas pedal (access, update) and a clutch (change schemas) but, alas, no brakes (security against unauthorized or unintended access or change to data base contents throughout the network).

Braude's fourth standard of equal performance of commands, regardless of their origin, is unlikely to be realized. Most distributed data base networks will have one predominant site that will supply most or all of the data needed to satisfy most requests.

Requests originating from remote sites, which, together, will supply only a minority of needed data to satisfy typical requests, are unlikely to perform in the same manner as equivalent commands issued from the predominant site. Nor is it important that they do.

Henry J. Meyer
Computer Consultant
Norwalk, Conn.

Packet truth

Congratulations on a fine Spotlight on T1 technology [CW, April 27].

I would like to correct a couple of points in Robert Dayton's otherwise excellent lead article, "Buying room for growth."

The article implies that fast-packet technology, as used by Stratacom, Inc.'s IBX, is somehow deficient in its handling of analog data modems.

This is incorrect. The fact that packets, and not bit- or byte-interleaved multiplexed circuits, are used on T1 trunks within an IPX network in no way degrades the performance of analog data modems. The IPX uses industry-standard Pulse Code Modulation or Adaptive Differential Pulse Code Modulation speech digitization and transmits modem data over voice channels just as well as the telephone network.

The article also states that Digital Speech Interpolation has "an inherent clipping characteristic and may interfere with analog data modem performance." Modern-speech detection algorithms, as implemented by Stratacom and other vendors, produce no audible clipping as did early Time Assignment Speech Interpolation systems. Additionally, they also include voice-band data detection.

David P. Owen
Director of Product Marketing
Stratacom, Inc.
Campbell, Calif.

This week in history

May 30, 1977
Dr. Carl Hammer, director of computer sciences at Sperry Univac, says that by the year 2000, one million to 10 million secretaries could be put out of work by a data processing development that permits voice input to be translated directly into print. It is the DP industry's responsibility to prepare society for this eventuality, Hammer says.

May 31, 1982
Amid a flurry of product announcements, Wang Laboratories, Inc. takes the wraps off its first personal computer, the Wang Professional Computer.

Changing Tops

I would like to commend you for "Network vendors line up behind IBM" [CW, April 20].

However, one of the author's statements, while technically correct, was a bit misleading. She stated that Centram Systems West, Inc. "faces a major change in its network operating system, Tops."

It is true that adding IBM OS/2 compatibility will entail a "major change" in our network operating system. However, this will not affect our existing products.

Tops' modular, layered architecture was designed to enable us to add new operating systems to the Tops product line relatively easily. IBM's introduction of OS/2 requires exactly that — the addition of a new operating system to our product line. Any alterations to the current Tops operating system will be incorporated only into Tops for OS/2.

Centram is committed to providing compatibility with IBM's Personal System/2 family. Tops is already compatible with the PS/2 Model 30. We anticipate introducing the new additions to the Tops line in the second quarter of 1988.

Kim Criswell
Director of Corporate Communications
Centram Systems West, Inc.
Berkeley, Calif.

COMPUTERWORLD

Now in Our 20th Year!

YES! I want to take advantage of this celebration offer . . . a full year of COMPUTERWORLD, plus all 12 COMPUTERWORLD FOCUS issues for just $35, a savings of $9 off the basic rate. And, I'll receive my FREE Magic Mug with my paid subscription.

☐ Bill me. ☐ Payment enclosed. Address shown: ☐ Home ☐ Office

FIRST NAME M.I. LAST NAME

* U.S. only

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

1. **BUSINESS/INDUSTRY** (Circle one)
   - 10. Manufacturer (other than computer)
   - 20. Finance/Insurance/Real Estate
   - 30. Medicine/Law/Education
   - 40. Wholesale/Retail/Trade
   - 50. Business Service (except DP)
   - 60 Government — State/Federal/Local
   - 65. Public Utility/Communications Systems/Transportation
   - 70. Mining/Construction/Petroleum/Refining/Agriculture
   - 80 Manufacturer of Computers, Computer-Related Systems or Peripherals
   - 85. Computer Service Bureau/Software/Planning/Consulting
   - 90. Computer/Peripheral Dealer/Distributor/Retailer
   - 75. User Other ____________
   - 95. Vendor Other ____________ (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   - IS/MIS/DP MGT
   - 19 Vice President, Asst. VP
   - 21. Dir., Mgr., Suprv., IS/MIS/DP Services
   - 22 Dir., Mgr , Suprv., of Operations, Planning, Adm. Services
   - 23. Dir., Mgr , Suprv., Analyst, of Systems
   - 31. Dir., Mgr., Suprv., of Programming
   - 32 Programmer, Methods Analyst
   - 35. Dir., Mgr., Suprv., OA/WP
   - 38. Data Comm. Network/Systems Mgt.
   - OTHER COMPANY MANAGEMENT
   - 11 President, Owner/Partner, General Mgr.
   - 12 Vice President/Asst. VP
   - 13. Treasurer, Comroller, Financial Officer
   - ENGINEERING
   - 41 Engineering, Scientific, R & D, Tech. Mgt.
   - SALES
   - 51. Manufacturing Sales Reps., Sales/Mktg. Mgt.
   - OTHER PROFESSIONALS
   - 60. Consulting Mgt.
   - 70. Medical, Legal, Accounting Mgt.
   - 80. Educators, Journalist, Librarians, Students
   - 90. Others ____________ (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply) Types of equipment with which you are personally involved either as a user, vendor, or consultant.
   - A. Mainframes/Superminis
   - B Minicomputers/Small Business Computers
   - C Microcomputers/Desktops
   - D. Communications Systems
   - E Office Automation Systems
   - F No Computer Involvement

3220B8722

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
BOX 1016
SOUTHEASTERN, PA 19398-9984

LAN-locked by sales problems

Opening the channels of communication for the isolated PC user

ASHLEY GRAYSON

This week's quiz: What three forms of human communication have appeared in the last 20, 10 and 2 years — methods that allow anyone to say something to everyone about themselves? Hint: All reach the local area or work group but none involve computers. (Answers at the end of the article.)

This column discusses personal computer networks but is really about human communication. The MIS manager's most frequent anxiety about PCs in his organization is that end users suffer from device and data isolation. Replicating peripherals on many PCs is only an expense, but data skew is a disaster in the making. Since PCs are often used in high-level planning, obsolete information can foul up the bottom line.

Local-area networks (LAN) allow users in geographic proximity to share data across a network, thus minimizing the stagnation of information on isolated PCs. LANs also allow the sharing of devices such as printers and plotters within a work group, which can lower equipment costs and improve accessibility of the units.

These solutions are available now, but are they really solving the problem? Obviously not, or LANs would be outselling copies of Lotus Develpment Corp.'s 1-2-3 every week.

LAN vendors will have to overcome sales difficulties by addressing five problems.

1. **People.** People buy PCs to do their own thing. It's an attitude statement. I think companies buy PCs because they genuinely want to give their people good tools. And PCs are great tools, but they are not, nor is the software that runs on them, designed to share data or devices.

Companies facing a serious data-sharing problem already own a Digital Equipment Corp. VAX, Hewlett-Packard Co. 3000 or IBM system with a gaggle of terminals. However, those companies that grew up with PCs need to move with caution. A LAN, even one with a big file server, often only delivers a committee approach to data processing where a multiuser system would make more sense.

PEOPLE buy PCs to do their own thing. It's an attitude statement.

Will the employees give up their PCs for a terminal? Probably not. Tying the PCs together as terminals to the multiuser computer may be the answer, if the users will learn a second operating system. Education and self-understanding can help, but one user will have to step forward and become the MIS director for microsystems to make this effort succeed.

2. **Economics.** Many PC users reason, "Why should I spend about $2,500 for a four- or five-node LAN to share my old HP Laserjet Plus, which cost $3,500, when I can buy a new Laserjet II for the same $2,500?" Two printers are usually worth more than improved access to one printer. High-speed LANs suffer from even rougher economics. A work group may need to share dozens of devices before the cost is justified, and most work groups are not that big. A very expensive peripheral or gateway to a larger network can change those economics, however.

3. **The way people work.** In small groups, a quick game of "toss the floppy" will transmit a lot of data and give the user a chance to schmooze with a coworker along the way.

But this media hand-off may not remain viable much longer. The disk and tape vendors are working to make physical exchange more difficult today: 1.2M-byte disks, 3½-in. disks, a dozen disk cartridge and tape back-up formats make hand-to-hand transmission impossible. A well-designed office automation system will enhance the scope of personal interaction and bypass the media problems.

4. **Sales** (the most serious problem of all). One person buys a PC. That person can be reached by advertising, word of mouth, a cold call from a sales rep or retail clerk when he wanders into the store. One happy PC user can breed a whole department of them by being a good example, and the rush is on.

In contrast, only a group can buy a LAN, and one hold-out can blow the deal. Selling a LAN requires an informed buyer, an operational need and users who will make it a success. Reaching all the parties whose cooperation is required to make the sale raises the vendor's cost and requires different skills than most PC sales people have developed.

Continued on page 22

Grayson is the founder of ADG, a San Pedro, Calif.-based organization that develops sales tools and programs for high-technology companies. Having spent 11 years marketing large systems for Digital Equipment Corp., he now works extensively with IBM-compatible micros.

One fell swoop: Jobs in, computer technology out

DONNA RAIMONDI

"Off with their heads!" yelled the Queen of Hearts in "Alice in Wonderland." She had found a solution to any problem that vexed her. A latter-day descendent of hers, a city councillor in Oberhausen, in West Germany's industrial heartland, proposed to "off" all computer systems as a solution to the town's unemployment problems.

The city councillor, hostile to technology in general and to computers in particular, proposed that the elimination of computers would put people back to work, reducing the 15% unemployment rate in the city of 237,000 people. If the town let people resume the pencil-pushing details of local government, unemployment might go away.

The councillor got this proposal on the table, where it was voted down. But suppose the councillor achieved his computerless town. Let us, like Alice, consume a bite of mushroom that shrinks us so we cannot be seen as we wander into Oberhausen and view Alma Secretary sitting at her office workstation.

"Alma," says the message on her screen, "please send me Form No. 3124 with lines four through seven filled in by the city administrator and lines eight through 10 by the public works chief." Alma speeds the messages to the officials. Their answers return electronically; she inserts it into the document and zaps it off to the boss. The job takes six minutes, because, unlike the real world, the officials are not in a meeting or drinking coffee with their staffs.

The next day the edict to remove technology has been ac-

Continued on page 22

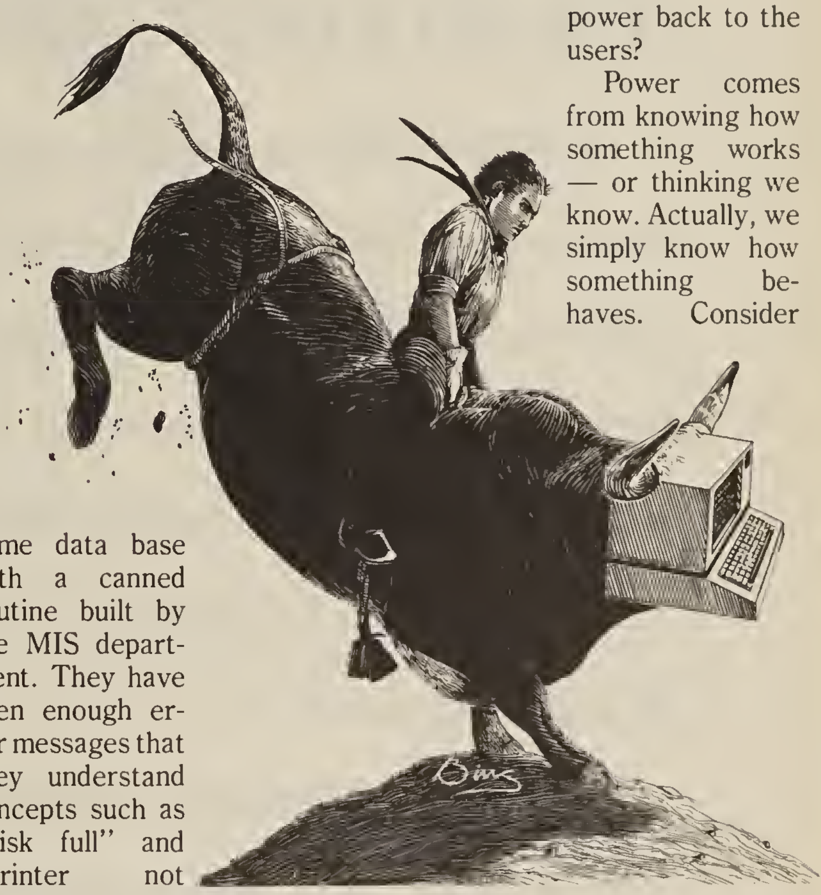
Raimondi is a *Computerworld* senior writer.

Riding the power of a bullish system

ESTHER DYSON

As computers become more powerful, they make the user feel less so. That paradox underlies much of the resistance to IBM's new Personal System/2 and Operating System/2. Forget the problems of changing disks, incompatible boards and the like — those matters can be overcome with the help of third-party vendors eager for a new buying cycle. The real issue is complexity.

A lot of users have reached the point at which they are proficient with 1-2-3 or Wordperfect. They can format a disk and maybe download a file or two from some data base with a canned routine built by the MIS department. They have seen enough error messages that they understand concepts such as "disk full" and "printer not found." When something goes wrong, chances are they can figure out what has happened and maybe even fix it.



CHRISTOPHER BING

The PS/2 and OS/2 are going to change their world, and they are afraid that it won't be for the better. Have you ever tried to install a local-area network (LAN), let alone a couple of pop-up programs? Then you'll love the new systems. You can spend days doing it and get paid for it.

But personal computers have now spread into the general populace. These people consider it an imposition to spend more than half an hour on anything not directly productive — and learning a new program or building an automatic network log-on routine don't qualify.

So the race is on between systems designers, building platforms of ever-greater power, and application builders, trying to transform that power into user-friendliness. It's not certain the latter will win. True, Microsoft Corp.'s Windows (soon to be transformed to Presentation Manager) seems to be making a good start

But there are two problems: hard failures, when the system breaks, and soft ones, when the user "breaks" and can't figure out what to do. Solving the first problem isn't easy, but it's definable. Solving the second is tougher: How do we give the power back to the users?

Power comes from knowing how something works — or thinking we know. Actually, we simply know how something behaves. Consider the toaster: You may not know how electricity works, but you know it passes through the coils, heats them and they warm (or burn) the bread. You can turn the current up to get the toast you want, or you can watch it and pop it up when you think it's ready.

That familiarity level will disappear for a while as we adjust to OS/2 and multitasking. The best software designers will build systems that feel intuitive and reveal their structures. What applications are open on the multitasking PS/2? Those icons in the corner of Microsoft's Windows/Presentation Manager can tell you. That doesn't mean you need pictures in place of file names, but it does mean a tree showing directories and subdirectories would be handy.

The PS/2 with OS/2 will enable systems designers to do awesome things. Applications

Continued on page 22

Dyson is editor and publisher of "Release 1.0," a leading newsletter about the personal computer business and the transformation of artificial intelligence into a commercial technology. She is also president of New York City-based EDventure Holdings, which publishes "Release 1.0" and holds the annual PC Forum.

LAN-locked

CONTINUED FROM PAGE 21

Now what unthought-of or unperfected function could LANs provide that would justify their cost, affect the work habits of the users and ease the sales problem?

Do LANs make PCs easier to use? Not really, except as a data transmission channel; but in so doing, they reduce the human interaction that occurs when people get together to "go over the figures."

Do LANs reduce errors? Who knows?

Do LANs allow PC tasks to be divided among many people to get them done quicker or with more of the benefits of teamwork? Probably not; the PC is a loner's tool, and the most popular software has reinforced that behavior. Don't the software vendors' promise, "You can do it all at your desk?"

5. **Who's in charge here?** Nobody, and that is part of the problem. LAN vendors are concentrating on stringing wires. But the value of the products depends on the application layer — what the buyer can use. As long as spreadsheets and word processors are rated on how they empower the individual, rather than how they allow sharing the task, they won't spur the growth of LANs. Their appeal is that they help the user be independent of others.

Buyers have added to the confusion in another way. Many office automation vendors have been told by the potential customers that whatever they deliver must "work exactly like our present system down to the forms formats." What everyone forgets is that how we work today is not the ultimate way for people to communicate; it is what we suffer with until a better solution becomes available. By constraining the future to resemble the past, we are delaying the appearance of that better solution.

And now, the answers to the quiz question. In the last 20 years: the message T-shirt — "I may not be perfect, but parts of me are excellent" (aphorism by Ashleigh Brilliant); in the last 10 years: the message coffee cup — "When life gives you lemons, make lemonade"; in the last 2 years, the yellow diamond-shaped sign for a car's rear window: "Ex-husband in trunk."

One fell swoop

CONTINUED FROM PAGE 21

complished. "Alma," shouts the boss from the next room, "bring me Form No. 4123, with lines four through seven filled in by the dog catcher and lines eight through 10 by the cemetery caretaker."

Alma misses this message because she is busy adding toner to the copier that has not been used since she got her multiple-copy personal computer printer. She misses it again because she is in the stationery store buying bond paper, carbon sheets, correction tape and ribbons for her resurrected typewriter. As she stumbles into the office with supplies in hand, she finally gets his directive.

Alma calls the dog catcher first, but his line is busy. She tries the caretaker. "I need to know the answer to two questions," she says. "All right," the caretaker says. Two hours later, he calls back, having searched through file cabinets to retrieve two bits of information.

The dogcatcher, however, is gone all day. Because he has no secretary and no longer owns an electronic mail system, he does not get the request until the next day. Responding as quickly as he can — since the information is stored in a cardboard box in the attic — he finally calls Alma with the information.

For one form it has taken two days to gather information and another hour to type because Alma's typing mistakes take so long to correct the old-fashioned way.

The councillor is thrilled. Offices all over town must hire secretaries, assistants and receptionists to answer phones, type documents and run errands to keep the offices going. But he is troubled because most of the people being hired are not unemployed iron workers or coal miners. And Alma's boss is not at all happy, because Alma quit to take a job in a town with better technology. After all, you can't keep them down on the typewriter after they've seen WP.

A bullish system

CONTINUED FROM PAGE 21

will include multitasking so that while an application is doing your bidding, it can also figure out what you might want to do next so it can get the data early and amaze you with its response time.

But how easy will it be to install this stuff and hook it up to the other server applications? How much will the user need to learn to use all that power? Will applications from different vendors work together, or will there be inconsistencies that anyone can get around with a couple of macros?

The new systems have the potential to make it easier — if developers remember that at midnight, $200 in a cash machine is worth more than $2,000 in the bank. Only power that the user can control has any value. There's one thing I still ponder. Is that sense of power just an illusion? Is the cash from the machine really just a loan and not an amount you own?

It bothers me that a user who could hope to understand what is going on in his DOS application probably could never figure out all the threads in his "friendly" multitasking OS/2 application. And yet the toast from the toaster sure beats what my English grandmother grilled under the gas flame.

In the race for integration, it's all come down to the wire.

The IBX® (Integrated Business Exchange) from InteCom, the first integrated voice/data switching system, places all your telephone calls. It provides access to host computers. And extends local area networking over greater distances than ever before. All through a unique two pair wiring system that is rapidly changing the face of communications. Already the IBX is helping companies and organizations worldwide become more productive.

Companies like Air Products and Chemicals, Inc., where a major portion of the network uses fiber optics. The Planning Research Corporation, where InteCom's LANmark™ feature eliminated redundant, coax-based LAN networks. And Lehigh University, which used the IBX to join over 110 buildings on campus.

The IBX can help your company save both time and money. No matter what business you're in. No matter what information you need. And no matter what computer system you're presently using.

For a customized demonstration or more information on the IBX and other InteCom products, call 1-800-INTE-800.

In Texas, call 214-727-9141 ext. 2661.

The Formula for Integration

InteCom Inc.
A SUBSIDIARY OF WANG LABORATORIES

© 1987 InteCom Inc. A wholly-owned subsidiary of Wang Laboratories, Inc., 601 InteCom Drive, Allen, Texas 75002
The IBX is a registered trademark of InteCom Inc. LANmark is a trademark of InteCom Inc.

YOU CAN'T DEVELOP THE WORLD'S BEST SOFTWARE ON THIS.

Fifteen years ago, the typical business software vendor worked with an R&D budget that could just about lace up his sneakers.

That's because the head of R&D was also the president and the night watchman. And his only product was a hot accounting package – a general ledger or fixed asset system.

As one of the companies that did, in fact, start out that way and ended up on top, we can tell you something about shoestring budgets and single package technology. They may be the things that got us on the map, but they aren't what made us grow into the McCormack & Dodge of today. A global company offering advanced application software to support a multiplicity of needs. As well as a complete set of tools to help end users get more out of every package.

The most important of these is Millennium®: SDT, a systems development tool that lets our users design applications on-line in the same borderless environment we work in at M&D. On all the major databases, including DB2.

Such leadership products are not created out of thin air. They come out of well-funded R&D teams, supported by Dun & Bradstreet resources.

These days, instead of developing applications on a shoestring, we develop them on Millennium: SDT. May we suggest you do the same?

McCormack & Dodge

a company of
The Dun & Bradstreet Corporation

Financial, human resource, manufacturing, and application development software for mainframe and minicomputer environments. Call 1-800-343-0325.

© 1987

When you think about it, relational DBMS products have a lot in common. They're all built around SQL. Most include 4GL tools. They all have a list of features and functions you can check off one at a time. And they all claim high performance.

But once you really get to know relational DBMS products, the differences between them become as clear as the differences between a great wine and a lesser vintage. It's the care in blending quality ingredients that produces a really great product.

And that's why INGRES is now establishing itself as today's DBMS standard.

INGRES runs on everything from mainframes to minis to workstations and PCs. And our new INGRES/STAR, the first distributed DBMS, lets users work with data from all your corporate databases and systems. Anywhere in the world. As a result, just like any vintage product, we're recognized by leading experts in the field. INGRES has been voted "Best DBMS/4GL" by *Digital Review* for two years running.

We have also delivered such a consistently high level of customer satisfaction that 99% of our customers stay with us, year after year.

Here's what it all comes down to: You can't tell a great wine from an ordinary one just by reading the label. And you can't really get to know a DBMS just from a data sheet. That's why we'd like you to experience INGRES first-hand.

Just send in this coupon, or call us. And get a taste of what a superior relational DBMS can do.

Yes, I'd like a taste of INGRES. Please: 101
☐ Send me more information about INGRES.
☐ I'd like to attend a free INGRES seminar in my area.
☐ I'd like to know more about the INGRES sampler.
☐ Have a salesperson call me.
Name__________
Company__________
Title__________
Mailing address__________
City__________ State_____ Zip_____
Telephone__________

Mail to: INGRES,
Relational Technology Inc.
1080 Marina Village Parkway
Alameda, CA 94501-9891
Or call: 1-800-4-INGRES

INGRES
Relational Technology Inc.

© 1987 Relational Technology Inc.

SOFTWARE & SERVICES

SOFT TALK

Charles Babcock

Building Big Blue bridges

There is a strong software orientation to an IBM announcement these days, even when Big Blue is offering new pieces of big iron.

The recent introduction of four new models of the 4381 processor and a low-end 3090 mainframe included a major reference to what is now IBM's dominant software theme: "IBM today further strengthened its customer partnership by announcing additional function and productivity tools for its relational data bases."

Clearly, IBM's emphasis is turning toward relational data base management systems and related query products as a means of offering a bridge across its disparate hardware and operating system lines. When the competition appears to be a minicomputer vendor that can boast an operating system with ease of communication between varied processors, IBM has been forced to come up with an answer, and relational technology appears to be a big piece of it.

Continued on page 28

IBM extends library, languages

Tailors math subroutines for 3090, Pascal version for MVS/XA

BY CHARLES BABCOCK
CW STAFF

NEW YORK — In addition to a new release of DB2, IBM announced a series of software enhancements at its recent briefing here, including an expanded library of mathematical subroutines and a version of Pascal.

The Engineering and Scientific Subroutine Library (ESSL) Release 2 provides 112 new mathematical subroutines tailored to the IBM 3090 with Vector Facility. IBM spokesmen said the total of 212 subroutines will yield the highest performance gain when used for matrix multiplications, matrix-vector linear algebra subprograms, fast Fourier transforms and simultaneous linear algebraic equations. Release 2 doubles the number of routines available in Release 1, IBM spokesmen said.

The subroutines are used in a variety of mathematical calculations, including structural analysis, computational fluid dynamics and nuclear engineering.

The library will be available in October for a monthly license charge of $700 or a graduated, one-time charge of $14,700 for a Group 20 customer, $21,000 for a Group 30 customer and $33,600 for a Group 40 customer. The groupings are based on mainframe processor size, with the new high-end 4381 Model 23 falling into Group 30 and most 3090 models falling into Group 40, IBM said.

IBM expanded its stable of languages supported under MVS/XA by announcing VS Pascal, compatible with and extending ANSI's 1983 Standard Pascal and IBM's previously announced Pascal/VS. VS Pascal will join VS Fortran and ANSI Cobol 85 under IBM's Systems Application Architecture (SAA) umbrella. Eventually, applications developed under the standards enumerated in SAA will be supported across a variety of IBM hardware, company officials said.

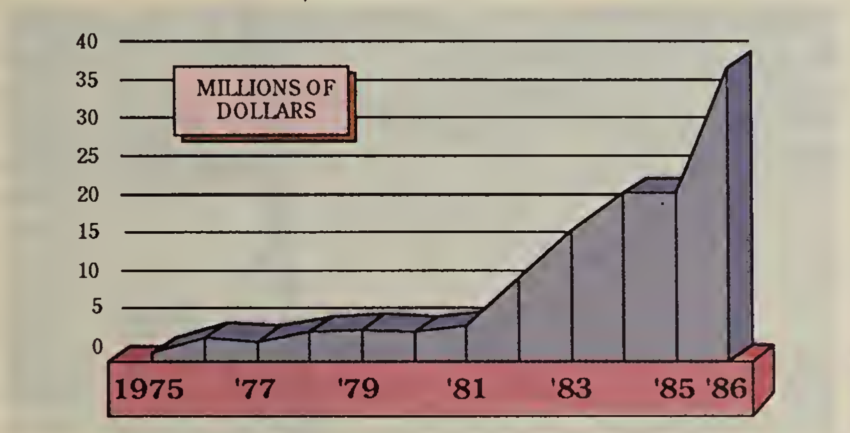
VS Pascal, and programs written in it, will be able to reside above the 16M-byte address space in MVS/XA that limits programs written in 24-bit pro-

Continued on page 33

Data View

Growth of Indian software exports

With low-cost programmers, Indian software companies have increased exports from under $1 million in 1975 to almost $39 million in 1986



INFORMATION PROVIDED BY DATAQUEST, INC.
CW CHART

Telon gets fresh look

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — Pansophic Systems, Inc. released Version 2.0 of its Telon application generator recently at the semiannual meeting of the Pansophic Users Learning and Sharing Exchange (PULSE) for Telon users here.

The release includes new support for IBM's DB2 and SQL products and also features major enhancements to Telon's perfor-

Continued on page 33

M&D ships materials module

BY ROSEMARY HAMILTON
CW STAFF

DALLAS — McCormack & Dodge Corp. recently said it is shipping a new module for its manufacturing software system that further automates materials management procedures.

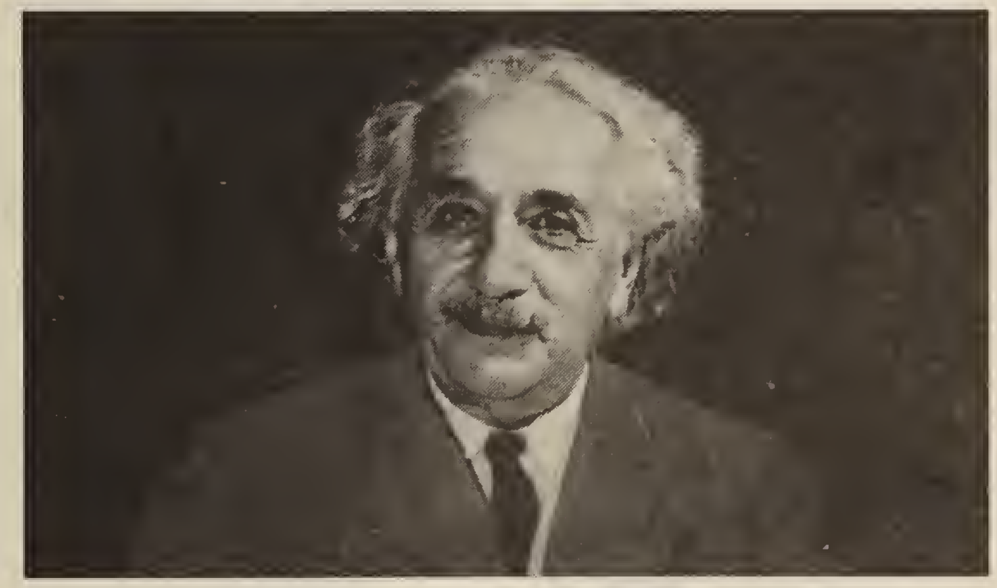
The ninth package in its Product and Inventory Optimization System (PIOS) line, the Materials Management System (MMS), can be licensed for $43,000. It runs under IBM's MVS operating system.

MMS is designed to make the order-assembly procedure more efficient, according to James Johnson, general manager of M&D's Manufacturing Business Unit. Typically, when an order is ready to be released, a pick ticket is issued to warehouse personnel that indicates which items from inventory are needed. The

Continued on page 32

Inside

- Dexplus translates documents from VAXs, IBM PCs and stand-alone systems. Page 26.
- Uccel expands its banking application line. Page 28.
- Some users of Sterling Software's Dylakor division want the company to branch out beyond IBM mainframes. Page 32.



Emc^2®

OFFICE AUTOMATION

Power through Simplicity™

Be recognized for bringing about new office productivity at your company. Select the preeminent Electronic Mail and Document Connectivity Tool for IBM mainframes—Emc^2

Emc^2 is so easy to learn, even your computer novice can use it right away. It is so resource efficient, it easily supports tens of thousands of users in the data base, with many hundreds concurrently on-line. And it runs under any standard MVS, VM or VSE teleprocessing environment you care to use, either now or in the future.

You get universal connectivity with Emc^2 It communicates between TSO, CICS, CMS, IMS, IDMS, VAP* and FIVS.*

It provides interfaces to DISOSS and PROFS. And seamless PC file transfer (including PC Binary files) for over a dozen PC boards and adaptors.

Emc^2 is full featured and fully supported. (Emc^2 innovated many electronic mail features now considered standard, and more are on the way.)

And Emc^2 is preferred time and again. Users who compare Emc^2 with other electronic mail and document transmission systems select Emc^2

Call 800-237-4510 for a free trial or more information. (In Florida, call 813-643-1500.)

Then get ready to claim the benefits of being known as your company's genius.

FISCHER INTERNATIONAL SYSTEMS CORPORATION
4073 Merchantile Avenue Naples, Florida 33942

*Emc^2 supports its own super economical, multi-user environments to vastly enlarge the population that can use it. VAP is a special VTAM application for MVS and VSE; FIVS is the multi-user Fischer-International Virtual System for VM.

Focus zooms in on VAX running Oracle DBMS

Information Builders claims interface boosts data extraction capabilities

BY NINAMARY BUBA MAGINNIS
CW STAFF

NEW YORK — An interface that allows users of Information Builders, Inc.'s Focus to extract information from Oracle Corp.'s Oracle data base management system on Digital Equipment Corp.'s VAX has been introduced by Information Builders.

The interface between Focus, an information center-oriented fourth-generation language, and the relational data base software from the Belmont, Calif.-based vendor adds to Information Builders' existing capability to access information on the VAX.

Focus users may currently extract data from DEC's Rdb relational DBMS and Record Management System (RMS) file program, the vendor said.

With the interface, Oracle data bases can use the Focus Join operations that permit up to 16 different Oracle, Focus, Rdb or RMS files to be dynamically linked on a stand-alone CPU or clustered CPUs or across a Decnet network, the vendor claimed. Join operations reportedly give users read access to all data fields within the joined structure.

Focus provides a data access and manipulation language that is consistent to users across hardware sizes and brands, Information Builders spokesmen said.

Easy on novices

Novice users can use Focus Talk Technology — a series of prompts and windows that give step-by-step instructions, allowing users to create reports and queries and data maintenance procedures without having to know a language's syntax — the vendor noted.

After Oracle data is accessed through the Focus interface, data can be ported to all other Focus operating environments, including an IBM mainframe, Wang Laboratories, Inc.'s VS, Unix and personal computers. Oracle data can be downloaded to the personal computer using Information Builders' PC/Focus DBMS. PC/Focus operates inside the 640K-byte limit under standard DOS 2.0 and higher, the vendor said.

The read-only interface to Oracle is priced from $1,750 for a one-time license, or $70 per month for rental, for Microvax II systems and costs $8,500 for a one-time license, or $420 per month, for the VAX 8800. The interface is available now.

GE RENTAL/LEASE

PC Flex-ability.

GE has the people, the equipment and flexible terms to reduce your risk of PC obsolesence.

GE Rental/Lease has combined with RCA to enhance its leadership in the industry through the addition of facilities and expertise. Now we're bigger. Better. More flexible than ever with equipment rental and leasing services for weeks, months, or years.

Send us the coupon below or call our toll free number **1-800-345-2451** to see how our rental/lease services will allow you to:

- Upgrade your systems.
- Expand your PC capability quickly.
- Meet your peak equipment demands.
- Test equipment before you acquire.
- Conserve your working capital.

GE Rental/Lease is extending its lead in the industry by improving our rental/lease services with features such as:

- Exclusive GE OFFICE MANAGER™ software to improve PC productivity.
- The most popular PC's and peripheral equipment.
- Depot or on-site service.
- Flexible leasing programs.

GE Rental/Lease is fast. Reliable. Now with more personnel and locations...delivering services already rated the best in the industry. But the most important thing we offer is what you need most...flexibility. The flexibility to provide exactly what you want, when you want it, for as long as you want it.

That's FLEX-ABILITY. Send us the coupon below or call toll free **1-800-345-2451** and we'll tell you more about it.

COMPUTER
SERVICE
A GE/RCA Enterprise

Please send me information about your flexible rental and leasing services today.
Name ____
Title ____
Company ____
Address ____ State ____ Zip ____
City ____
Phone ____
Send to: GE Computer Service, Rental/Lease Operation
P.O. Box 105625, Atlanta, GA 30348
Or call toll free **1-800-345-2451.**
PC-CW

Translator for All-In-1 bows

BY NINAMARY BUBA MAGINNIS
CW STAFF

Systems Compatibility Corp. and OA Technologies, Inc. have jointly announced Dexplus, a document translation package for the Digital Equipment Corp. All-In-1 office automation system.

Dexplus can transparently convert word processing documents created by DEC VAX, IBM Personal Computer and stand-alone word processing systems, the vendors said.

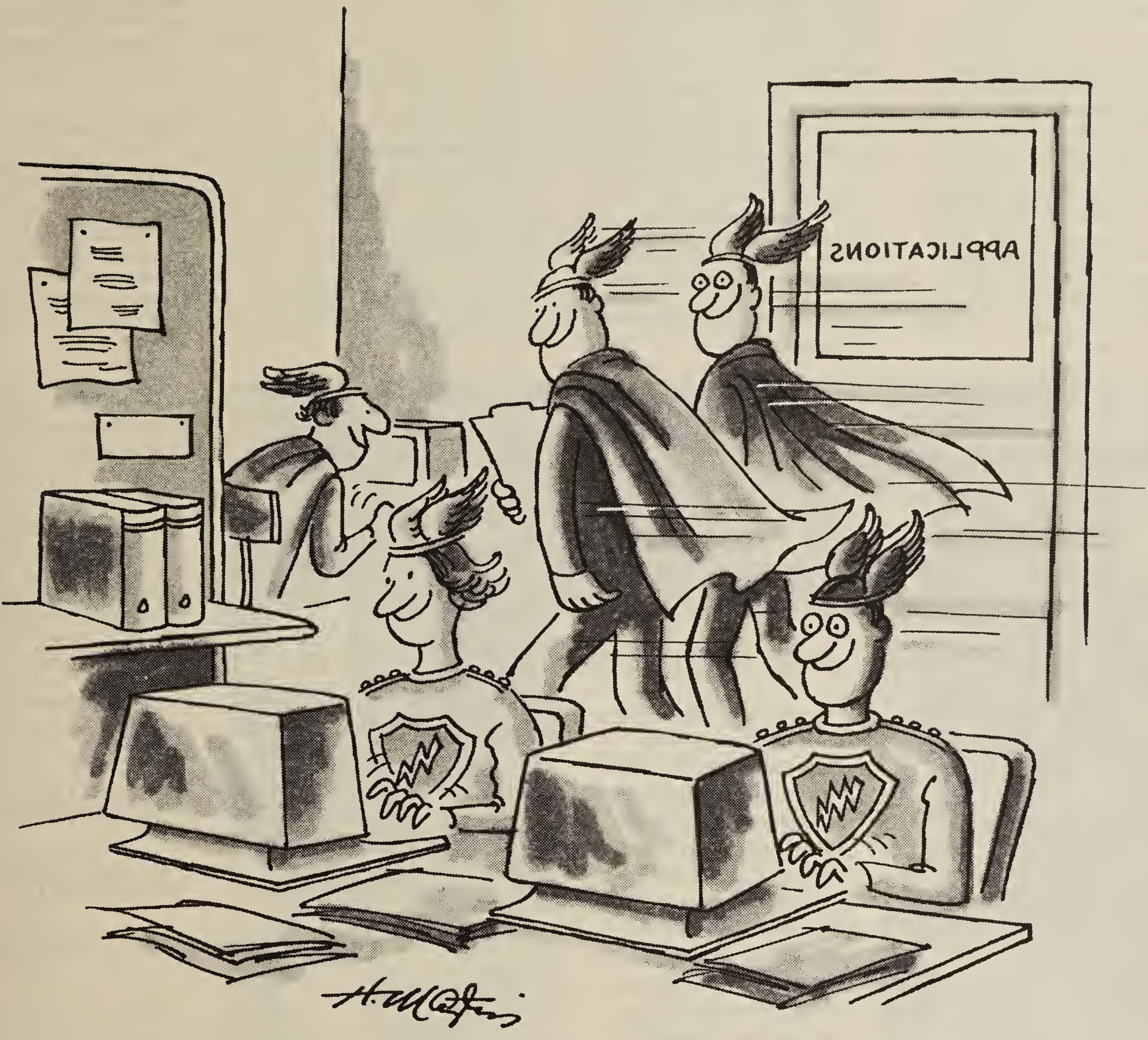
Chicago-based Systems Compatibility combined its Dex document conversion software with the St. Louis-based OA Technologies's All-In-1 and PC integration software. The resultant Dexplus allows users to print, edit, read and mail documents within All-In-1 that originate from more than 20 word processing packages, the vendors claimed.

Dexplus is reportedly transparent to All-In-1 users and requires no further training to implement. All-In-1 users can freely exchange documents whether they originate on the VAX, IBM PC or a stand-alone word processor without losing any word processing characteristics such as boldfacing, superscripting and footnotes, the vendors said.

Optional PC software enables users to transmit documents automatically to and from the PC and convert them to a format selected by PC users. Dexplus supports DEC's WPS-Plus, Marc Software International's Wordmarc, Wordperfect Corp.'s Wordperfect and Microsystems Engineering Corp.'s Mass-11 word processing packages on VAX systems.

The software, priced from $2,500 to $7,500, also supports Wordperfect, Ashton Tate's Multimate, Micropro International Corp.'s Wordstar, IBM's Displaywrite, Microsoft Corp.'s Microsoft Word, Samna Corp.'s Samna, Lifetree Software, Inc.'s Volkswriter, Wang Laboratories, Inc.'s Wang PC and other PC word processing software as well as Wang OIS/VS and other stand-alone word processors, the firms said.

Systems Compatibility manufactures word processing conversion products for a variety of mainframe, mini, PC and stand-alone word processing systems. OA Technologies is a software supplier and value-added reseller that exclusively markets products and services for All-In-1.



WITH REALIA, BE PREPARED FOR A FEW CHANGES IN YOUR PROGRAMMING STAFF

Give your applications developers Realia COBOL. Then stand back.

Realia COBOL brings the power of the mainframe right to your PC. You'll start saving time, money, and resources, whether you're maintaining an old system or creating a new one.

Realia COBOL offers your programmers the quickest compilation and the biggest file capacity of any PC compiler. A 10,000-line program compiles in 76 seconds. A 10,000-record sort takes 43 seconds. Best of all, Realia-compiled programs execute faster than any other PC compiler's. With RealCICS®, you can even handle online CICS programs.

At Realia, we also offer you something that has become a bit of a contradiction in terms: genuine support for a micro software product.

Realia COBOL—when time is of the essence.

REALIA®

10 South Riverside Plaza, Chicago, IL 60606 • (312) 346-0642 • Telex 332979

Building bridges

CONTINUED FROM PAGE 25

Never mind that in a second year of flagging IBM revenue and depressed profits, references to a strengthening "customer partnership" sound like another genuflection to the advertising theme "The Year of the Customer," if not a phrase copped from the school of Soviet Socialist realism. IBM is a kind of sovereign state, and internal needs must be superimposed on external reality, even when it contradicts a few facts. So the May 19 briefing in New York offered clues as to where IBM sees its greatest need and how software appears to be the answer to those needs.

In a reference to relational application development assistance, Edward C. Lucente, group executive of the Information Systems Group, said "These application-enabling products greatly increase the usefulness of relational technology for all users, assuming greater efficiency and productivity for our customers." This appears to be a relational technology convert, since Lucente's roots go back into the hardware manufacturing side of IBM.

As other observers have noted, IBM took pains to present Data Extract, DB2, SQL/DS and Query Management Facility as a "family" of relational products, even though prior to the new releases a sophisticated SQL query to DB2 might yield an answer different from the one obtained from SQL/DS.

IBM can be expected to further emphasize the "family of products" approach. On the same day that IBM officials gathered in New York, two top IBM speakers addressed software users groups and told them there was more to come.

In Chicago, *Computerworld* correspondent Jean Bozman listened as George E. Zagelow, manager of data base strategy and architecture at IBM's Santa Teresa, Calif., lab, told a Pansophic Systems, Inc. Telon users conference that, in the future, relational product users should be free to specify their own data types instead of being limited to those defined to the data base. Zagelow said IBM has been surprised by its customers' appetite for distributed data base products. "A survey of 80 customers for DB2 showed that among this group's top five priorities was some flavor of distributed data base. This requirement seems to be coming from out of nowhere, but it's coming on very strong," he said.

Dictionary needs

In Los Angeles, *Computerworld* correspondent Jim Martin listened as Norris van den Berg, manager of advanced data base products for IBM in San Jose, Calif., said IBM has offered a data directory with Release 3 of DB2 and, in the future, the company will address the need for a dictionary that can control data definitions and rules for data elements regardless of where they originate in an IBM system.

That's a tall order for MVS alone, which mixes file management with heirarchical and relational data base data.

But if IBM is to rope the virtual memory-based 9370 into the circle of cooperating mainframe processors, it will need a VN-based DBMS that can function in conjunction with DB2 and other MVS products. To do that, it will need a repository-type product, or what van den Berg called "a nonbypassable dictionary. What you see now is a directory, not a dictionary. But it's a start and shows that IBM is working in that direction," he said.

Babcock is *Computerworld*'s senior editor, software & services.

Uccel bolsters banking line

BY ROSEMARY HAMILTON
CW STAFF

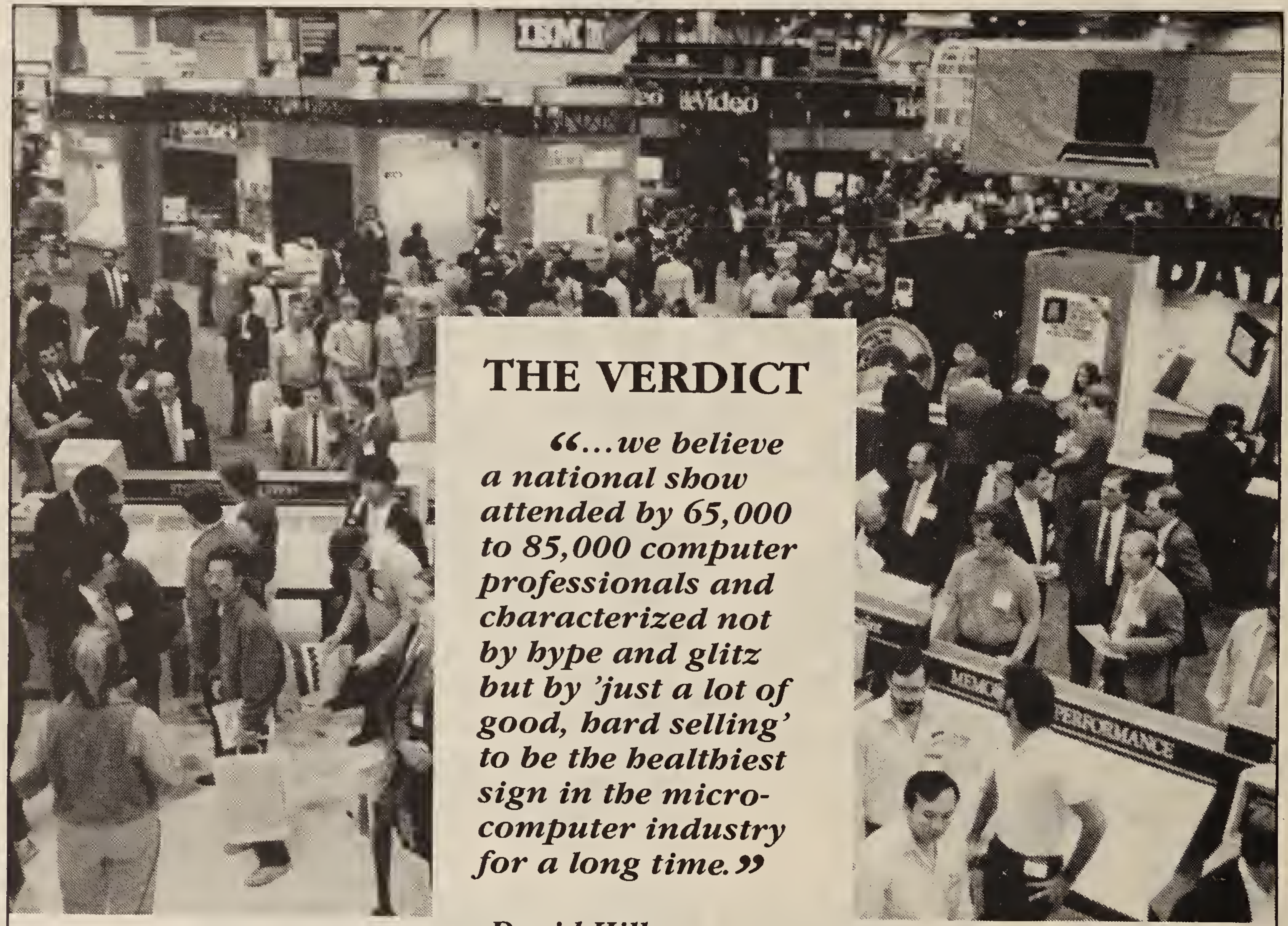
DALLAS — Uccel Corp. continued its expansion of the Infopoint series of banking applications with the introduction of three packages late last month.

As with many other products in the Infopoint series, which was designed for the IBM MVS and VSE environments, this new batch of applications results from recent product and corporate acquisitions.

Infopoint Wire, currently at a beta-test site, is scheduled for release in the fourth quarter, the vendor said. It allows users to track funds transferred over telecommunications lines to the Federal Reserve Board. It supports the Federal Reserve's messaging protocol, FRCS80, Uccel spokesmen said. Infopoint Wire will be priced at $250,000.

The vendor also introduced Infopoint Cashtran, a product acquired from Dyna-Quire, Inc. in Dallas. It was designed to assist users in reporting cash transactions of $10,000 or more, as required by the Bank Secrecy Act. A license for the software, currently available, is priced at $25,000. A version that would run in a real-time environment is under development, but no availability date has been scheduled, spokesmen said.

Finally, Uccel released Infopoint Morgtage for immediate availability. The product results from the recent acquisition of Atlantic Data Services, Inc. in Quincy, Mass. While part of the Infopoint line, it will be offered as a stand-alone system to the mortgage market and is priced at $150,000.



THE VERDICT

"...we believe a national show attended by 65,000 to 85,000 computer professionals and characterized not by hype and glitz but by 'just a lot of good, hard selling' to be the healthiest sign in the microcomputer industry for a long time."

David Hill
Editor
MICRO MARKETWORLD
11/24/86

Exhibitors, attendees and the press all agree. The excitement and sales momentum are back and growing stronger than ever!

The sales resurgence shifted into high gear at COMDEX/Fall '86. More new products, more new business, more excitement and optimism than ever before! Over 80,000 attendees from around the world came to meet with more than 1,200 exhibiting companies and to attend the most intensive—and most successful—COMDEX conference yet.

The excitement and anticipation are already building for COMDEX/Fall '87. Exhibit halls are selling out fast, with manufacturers in every segment of the microcomputer industry looking forward to the biggest and most important marketing event of the year. Plus, COMDEX/Fall '87 has been designated an International Trade Fair by the U.S. Government, and will be promoted worldwide to attract even more than the 7,000 foreign buyers who came in 1986. It's all shaping up now to make COMDEX/Fall '87 the most valuable event possible for manufacturers and resellers alike.

The verdict is in and the opportunities are unlimited! Complete and return the coupon today for information or call (617) 449-6600.

COMDEX/Fall '87
November 2–6, 1987
Las Vegas, Nevada
Produced by
THE INTERFACE GROUP, Inc.

CW 6/1/87

TELL ME MORE about new business and profit opportunities at COMDEX/Fall '87!

☐ Send me complete exhibitor information.
☐ Send me attendee information when available.

Name__________
Title__________
Company__________
Address__________
City__________State_____Zip_____

Return to: Mr. Richard Schwab, THE INTERFACE GROUP, Inc.
300 First Avenue, Needham, MA 02194

© The Interface Group, Inc.

The queen of the PROM has just graduated at the top of her class.

IRMA™ has been the most reliable and most popular PC-to-mainframe link ever created. But as good as our IRMA is, we've never said we couldn't do better. Fact is, a PROM is still a PROM. And you have better things to do with your time than spend it upgrading PROMs.

But now there's IRMA 2™; it marks a whole new era in terminal emulation technology.

IRMA 2 is software-loaded. So you can upgrade by simply changing diskettes instead of PROMs. What you also gain is an easy path to multiple host sessions, sophisticated mainframe graphics, and all that DFT technology can offer you down the road. And with our new E78 Plus™ software, you gain even more.

Like Mod 5 support. And easy-to-use menus for quick custom-configurations. And keyboard-remapping and key programmability. And perhaps best of all, you gain speed.

Introducing IRMA 2. The most reliable software-loaded PC-to-mainframe link.

All this new power of IRMA 2 is available right now for the IBM® PC,™ XT,™ and AT™ and the PS/2™ Model 30. And soon for all other PS/2 Models.

There's some especially good news for our current IRMA and Forte PJ customers, too. Because they can also take advantage of the new power of E78 Plus software.

For not a lot of money.

For a limited time, you can get E78 Plus at a special low conversion price. But you'll have to act soon.

Contact your local DCA distributor for all the details of IRMA 2 and E78 Plus software. Or call 1-800-241-IRMA, Ext. 504. In Georgia, call 1-404-442-4500.

dca®

IRMA, IRMA 2, E78 Plus and Forte PJ are trademarks of and DCA is a registered trademark of Digital Communications Associates, Inc. IBM is a registered trademark of and PC, XT, AT and PS/2 are trademarks of International Business Machines Corp. ©1987, Digital Communications Associates, Inc

Dylakor users seek products beyond IBM line

BY JAMES A. MARTIN
CW STAFF

WOODLAND HILLS, Calif. — Although most users of products from Sterling Software, Inc.'s Dylakor Division were generally upbeat at a conference here last week, some said they would like to see the company offer a broader base of packages.

Dylakor currently offers a line of IBM mainframe data management and utility systems such as the Dyl-280 II information management and report writer. But with MIS's increasing need to integrate and communicate with non-IBM architectures, some users said they wish Dylakor would extend its focus beyond the IBM mainframe realm.

"I know it doesn't sound realistic, but I'd like to see Dylakor put out its products for Digital Equipment Corp., Data General Corp. and other environments," said Brian O'Malley, an electronic data processing auditor for the U.S. General Accounting Office (GAO) in Washington, D.C. Because its DP environment is IBM, the GAO often must rely on a time-sharing service in order to audit client records on systems other than IBM mainframes, O'Malley said.

With the proliferation of microcomputers, an IBM Personal Computer-based version of Dylakor products is also on some users' wish lists. However, Dylakor has no plans to enter markets outside the IBM 370 architecture, according to Dylakor President Carole Morton. "It's not feasible for us because everything is written in IBM's assembler language, and it would have to be rewritten in C or some other language," Morton said.

Regarding a microcomputer version of Dylakor packages, Morton said the company is taking a wait-and-see attitude regarding the acceptance of the IBM Personal System/2 and OS/2 lines.

Overall, however, users gave the Dylakor family high marks in support, pricing and performance.

"The products are easy to use; I've never had an occasion to call for support, and the company is working hard to keep up in technologies with the right interfaces," said Jerry Goss, computer specialist for the Veterans Administration Office of the Inspector General in Austin, Texas.

Last week's users conference was the first in Dylakor's 19-year history. "This has been a valuable conference so far, but I don't know why we didn't have this kind of thing available to us before," commented Thomas Bloom, an electronic DP auditor for the GAO in Philadelphia.

Dylakor was founded in 1968 and acquired by Dallas-based Sterling Software in 1983.

SOFTWARE NOTES

Cullinet obtains package rights

Cullinet Software, Inc. is planning to market a data compression package for IDMS/R later this month, the company said. Cullinet paid $480,000 for the worldwide marketing rights to the program to **Ironwood Software** in Westlake Village, Calif., its developer.

Data General Corp. said it will market **Wordperfect Corp.**'s 4.05 word processing package and **Access Technology, Inc.**'s 20/20 multiuser spreadsheet, expanding the office software on its Eclipse/MV minicomputer.

Digital Equipment Corp. has joined a cooperative effort between the U.S. Defense Communications Agency, the National Bureau of Standards and Network Research Corp. to develop design specifications, conformance tests and prototypes for gateways between Department of Defense communications protocols and Open Systems Interconnect networking protocols.

M&D module

CONTINUED FROM PAGE 25

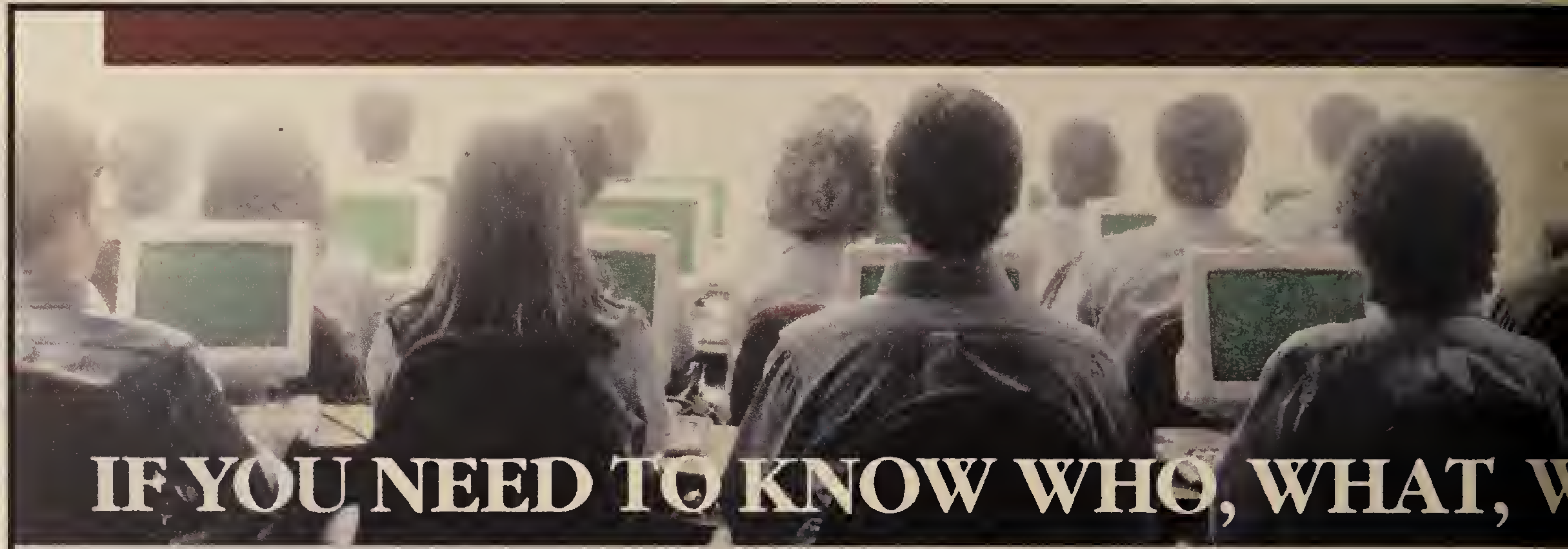
pick ticket can be issued manually, or, as in the case with the PIOS system, it is generated by one of the software modules.

With MMS, a master pick list is generated on a batch-job basis for a given business period. It is typically done for one business day but can be done more frequently, depending on the work load.

This pick ticket lists all inventory items needed for orders scheduled for release that day. Additionally, it lists the items in the order in which they are stored in the warehouse, Johnson said. As a result, workers can take one walk through the warehouse to collect items instead of making many trips.

MMS assembles such a list by accessing the PIOS Inventory module, which contains a data base that includes such data as an inventory item's part number, Johnson said.

Prior to MMS, individual pick lists were generated on a per-order basis by the PIOS Shop Floor Control module. Users can continue to use this feature along with MMS, Johnson added.


IF YOU NEED TO KNOW WHO, WHAT, W

BASIS®
Text Information Management System

BASIS was the first software system developed specifically for the storage and retrieval of large volumes of textual information. Today, with over 800 installations worldwide, BASIS remains the ultimate Text Information Management System (TIMS) available. Anywhere.

Design flexibility makes BASIS the ideal TIMS software for diverse information management needs.

From the boardroom, to the newsroom, BASIS' modular design offers flexibility in tailoring the application to the need. Which is why BASIS has helped automate corporate and technical libraries, research and development projects, law offices, government departments and agencies, financial and insurance companies, publishing concerns, educational institutions, manufacturing companies, and primary resource industries.

In fact, there really isn't much BASIS can't do when it comes to text information management. BASIS' system provides fast, efficient access to textual *and* numeric data in its databases for accurate and timely reporting.

BASIS ENABLES TEXT AND DATA RETRIEVAL FROM A GROWING WORLD OF INFORMATION. SIMPLY. QUICKLY. EFFICIENTLY.

BASIS is designed to keep pace with your world of information, and, without the constraint of hardware dependence.

Because BASIS is portable, your applications can run on many computers, minimizing your hardware dependency as applications increase in size…an important consideration when you are evaluating TIMS software for your text information management needs.

As sophisticated as BASIS may seem, it remains a system that is simple to use.

Fast, efficient information retrieval is possible in even the largest databases. BASIS uses "fast path" indexing techniques, providing a simple, yet powerful query facility that makes complex searching easy. Novice and casual users may retrieve information and generate reports using menus and simplified command statements. Advanced users may compose freeform query statements and generate ad hoc reports using the English-like query and data manipulation language. BASIS' help facility operates at three levels of expertise—beginner, advanced and expert so you always have immediate access to assistance.

© 1987

Telon's fresh look

CONTINUED FROM PAGE 25

mance, test-facility and documentation features.

The updated version is available at no additional charge to the installed base of Telon users, but support for the DB2 and DB2/SQL option will require an additional fee of $49,000.

Telon is a 4-year-old Cobol application generator for IBM's CICS, IMS/DC and batch environments.

There are 30 major changes in Telon Version 2.0, including a complete rewrite of Telon documentation, according to Al Lobeck, a Pansophic technical product manager.

"We've completely restructured our documentation, based on user feedback," Lobeck said. "We've improved the index and divided the documentation into a 300-page manual on concepts and a 1,000-page manual on components."

The older documentation ran 1,500 pages.

Changes important

Most users questioned last week said they feel that the documentation changes will be important to their day-to-day use of Telon.

"We're an older Telon user," said James Lair, development services consultant for the Dayton Hudson Department Stores in Minneapolis.

"Our staff is accustomed to modifying the macros in the documentation. . . . Now, it will be function-oriented, which is better for us," he added.

The most dramatic enhancement is the addition of support for the development and testing of DB2/SQL applications using Telon.

Generates SQL calls

A new feature, called Multiple Table Support, lets Telon generate all the SQL calls needed to access a series of tables, the vendor said.

Telon Version 2.0's DB2 catalog interface gives programmers the ability to map DB2 tables and views directly into Telon, according to the company.

A DB2 test feature allows developers to debug DB2 applications before they are ever run on a mainframe, spokesmen for the Oak Brook, Ill., firm said.

Performance changes are also key to the announcement, Lobeck said. Telon formerly generated 55% of the system calls to IBM's IMS data base management system.

Now, he said, Telon will automatically generate up to 90% of such IMS system calls. At the same time, programmers can use the same specifications for defining files in the VSAM, IMS and DB2 environments, reducing the need for file conversion, Lobeck said.

Telon Version 2.0 will now allow users to generate IBM's Cobol II and IBM's Exec DL/1 source code, giving better support for MVS/XA applications, the company said.

Expanded testing ground

Also, Telon's test facility has been extended, allowing selective tracing in IMS/DL/1 function codes, according to the vendor.

Prices for Telon vary according to user environment, ranging from $130,000 for CICS up to $190,000 for IMS/DC environments.

Users from many of the 100 Telon user sites represented at the Chicago PULSE conference said they plan to install Telon Version 2.0 as soon as it becomes available July 1.

Ron Lovell, systems support manager for J. C. Penney Co.'s Westerville, Ohio, data center, said, "We skipped the last release six months ago. We'll go for this one, though, because it has major performance enhancements."

IBM extends

CONTINUED FROM PAGE 25

gramming. VS Pascal applications will be able to use 31-bit programming, IBM said.

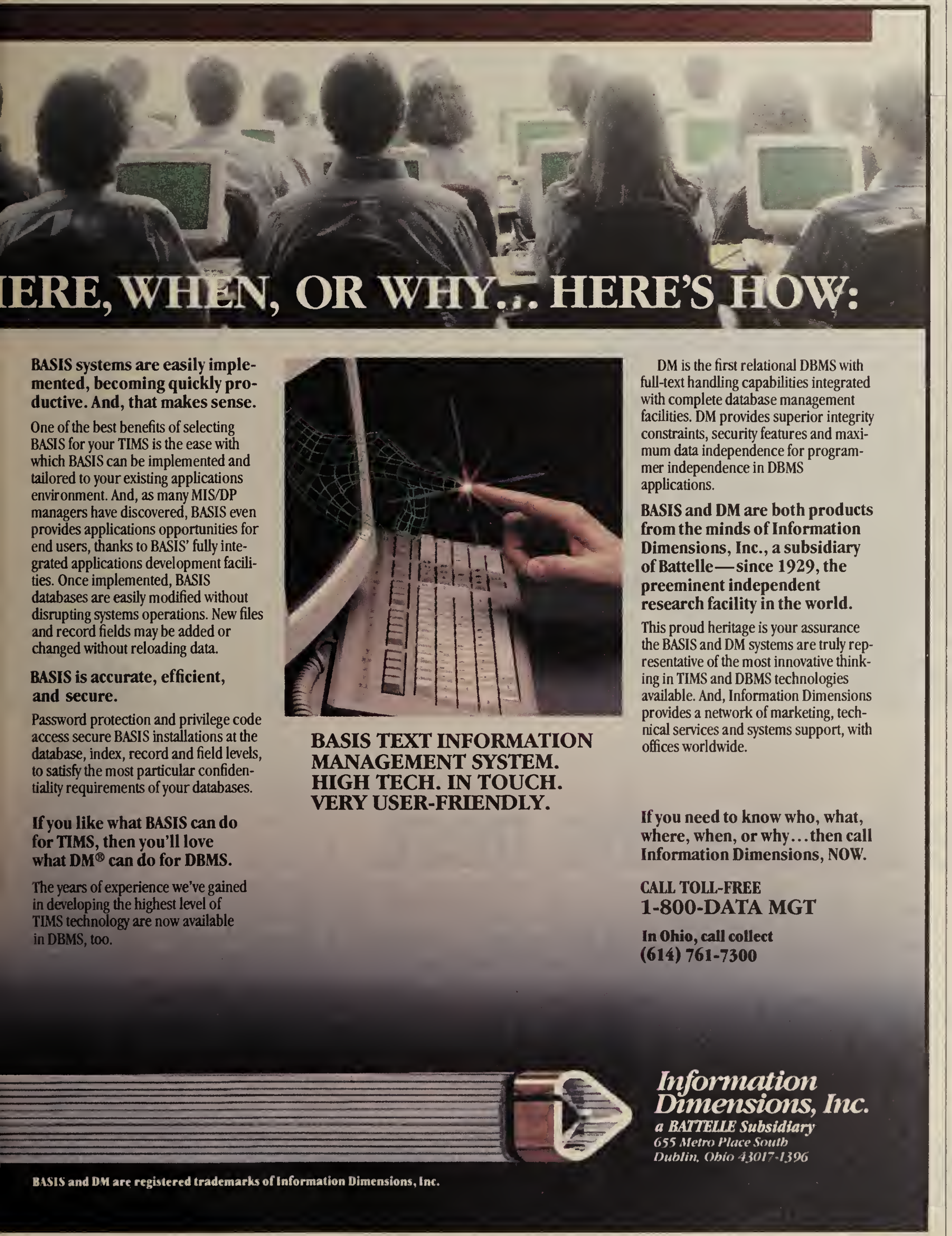
The extensions to ANSI-standard Pascal include the ability to develop programs in modules through the use of separate compiles.

Scheduled to be available June 19, IBM said, VS Pascal will be priced at a one-time, graduated charge of $6,000 to $24,000, depending on processor size. A monthly license charge will be $500.

IBM also announced Release 4 of TSO/Extended, its MVS teleprocessing monitor. It includes an application manager, which enables an administrator to add applications to an existing information center menu or create a new menu, IBM spokesmen said. Scheduled to be available Sept. 25, IBM said, Release 4 of TSO/E will be priced on a graduated, one-time charge basis from $17,900 to $28,640. It may also be purchased through a $1,500 initial license charge and $555 monthly payments.

IBM also announced Version 2, Release 1.0 of OS PL/I, to be available in March 1988. The new release was designed to improve programmer productivity, execution time and functions under MVS/XA. It is expected to include an Interactive Test Facility to allow testing and debugging of PL/I applications. When a subroutine is called but is missing, PL/I will provide a diagnostic message identifying the address of the origin of the call.

IBM said the new release will be available at a monthly license charge of $800 or graduated one-time charges of $9,600 to $38,400.


IERE, WHEN, OR WHY... HERE'S HOW:

BASIS systems are easily implemented, becoming quickly productive. And, that makes sense.

One of the best benefits of selecting BASIS for your TIMS is the ease with which BASIS can be implemented and tailored to your existing applications environment. And, as many MIS/DP managers have discovered, BASIS even provides applications opportunities for end users, thanks to BASIS' fully integrated applications development facilities. Once implemented, BASIS databases are easily modified without disrupting systems operations. New files and record fields may be added or changed without reloading data.

BASIS is accurate, efficient, and secure.

Password protection and privilege code access secure BASIS installations at the database, index, record and field levels, to satisfy the most particular confidentiality requirements of your databases.

If you like what BASIS can do for TIMS, then you'll love what DM® can do for DBMS.

The years of experience we've gained in developing the highest level of TIMS technology are now available in DBMS, too.

BASIS TEXT INFORMATION MANAGEMENT SYSTEM. HIGH TECH. IN TOUCH. VERY USER-FRIENDLY.

DM is the first relational DBMS with full-text handling capabilities integrated with complete database management facilities. DM provides superior integrity constraints, security features and maximum data independence for programmer independence in DBMS applications.

BASIS and DM are both products from the minds of Information Dimensions, Inc., a subsidiary of Battelle—since 1929, the preeminent independent research facility in the world.

This proud heritage is your assurance the BASIS and DM systems are truly representative of the most innovative thinking in TIMS and DBMS technologies available. And, Information Dimensions provides a network of marketing, technical services and systems support, with offices worldwide.

If you need to know who, what, where, when, or why...then call Information Dimensions, NOW.

CALL TOLL-FREE
1-800-DATA MGT

In Ohio, call collect
(614) 761-7300

Information Dimensions, Inc.
a BATTELLE Subsidiary
655 Metro Place South
Dublin, Ohio 43017-1396

BASIS and DM are registered trademarks of Information Dimensions, Inc.

NEW PRODUCTS

Systems software

Honeywell Bull, Inc. has announced **Computer-Aided Publication** (CAP) software for large-scale mainframe computers operating under CP-6.

CAP is said to integrate textual and graphical data to produce large documents such as technical manuals, engineering specifications and reports. Text editing, computer graphics, automated page-setting and other publication technologies are integrated with data base management software to provide a central repository of text and graphics.

CAP is available in Honeywell Bull DPS 8 and DPS 90 computers. It costs $50,000 plus a monthly fee of $400.

Honeywell Bull, P.O. Box 8000/A-79, Phoenix, Ariz. 85066.

BBN Software Products Corp. has ported its **RS/1** data management and analysis software package to Hewlett-Packard Co. HP 9000 Series 300 engineering workstations under the HP-UX operating system.

RS/1 software's capabilities include statistics, curve fitting, modeling and graphics as well as data management and analysis. The package also operates on HP's Vectra personal computer, Digital Equipment Corp.'s VAX, Microvax and PDP computers and IBM systems.

RS/1 software costs from $3,900 to $19,700.

BBN Software, 10 Fawcett St., Cambridge, Mass. 02238.

Applications packages

C.D.S. Computer Corp. has announced its **Remic/CMO System** designed to run under VMS on Digital Equipment Corp. VAX computers.

The system is said to support trustees and issuers involved with collateralized mortgage obligations. Processing any amount of collateral such as securities and loans, the system calculates cash flows, bond values and investment income. Calamity calls and collections are also accommodated.

The Remic/CMO System is priced at $300,000, including documentation, training and conversion.

C.D.S., Suite 205, 21243 Ventura Blvd., Woodland Hills, Calif. 91364.

Languages

Pyramid Technology Corp. has introduced **Pyrlisp**, a full-feature Common LISP system that runs across Pyramid's superminicomputer product line.

Pyrlisp is said to consist of an interpreter, compiler and debugger. It operates with the support of Dualport OSX, Pyramid's implementation of AT&T's Unix System V, Release 3. According to the vendor, Pyrlisp allows for both the development and the running of artificial intelligence applications.

Pyrlisp is priced at $6,000.

Pyramid Technology, P.O. Box 7295, 1295 Charleston Road, Mountain View, Calif. 94039.

Utilities

New Processing Corp. has announced **Release 1.0** of **Gender** for IBM mainframes.

Gender is a subroutine said to identify a person's name as male or female. The current dictionary contains 40,000 first names. The routine is said to be callable through Cobol or assembler.

A perpetual license for Gender costs $3,500, including the first annual maintenance.

New Processing Corp., Suite C2, 7650 E. Redfield Road, Scottsdale, Ariz. 85260.

Development tools

EVB Software Engineering, Inc. has announced CPU-based licensing for its Ada software components library, **Grace.**

Grace is a set of 275 generic reusable Ada building blocks based on a component taxonomy. Each component includes documented source code listings, all design documentation, at least one test program and a bibliography. Grace is not application specific and is said to be hardware and software independent.

Prices for Grace range from $4,725 for a single-user personal computer workstation to $26,250 for a mainframe.

EVB Software Engineering, 5320 Spectrum Drive, Frederick, Md. 21701.

Mitek Systems Corp. has announced a **development system option** for its M1010 IBM channel controller said to enable users to connect multibus-based peripheral devices to an IBM mainframe.

The option includes the Regulus operating system, which supports the C language, and a choice of a standard Motorola, Inc. 68000-based CPU or a 68020-based CPU.

The M1010 is an IBM channel-to-multibus adapter. It comes with the Mitek Access Method set of subroutines that run on the IBM mainframe. One M1010 control unit is said to allow up to 16 peripherals to be connected to the mainframe.

The M1010 is priced modularly starting at $16,000.

Mitek Systems, Suite 100, 2033 Chennault Drive, Carrollton, Texas 75006.

Sooner or later...
everyone leaves the nest.

Discover the benefits of TRW's quality maintenance and repair services for your IBM systems. Mainframes. Minis. Micros. And compatible peripherals. You'll find true security with TRW's expert and remarkably cost-effective service programs.

TRW's nationwide network of service professionals, thoroughly trained in maintaining IBM systems, are dedicated to keeping your equipment in prime operating condition. Whether it's preventive maintenance or emergency repair of an occasional malfunction, we'll keep downtime low so that your productivity remains high. With guaranteed fast response. 24 hours a day if necessary.

There's an economical, comprehensive TRW Service Program that's just right for your equipment and your requirements. Call 1-800-257-7464 today for all the facts. Take wing with TRW and discover the advantages of independence.

TRW

Third Party Maintenance
From A Company Called TRW

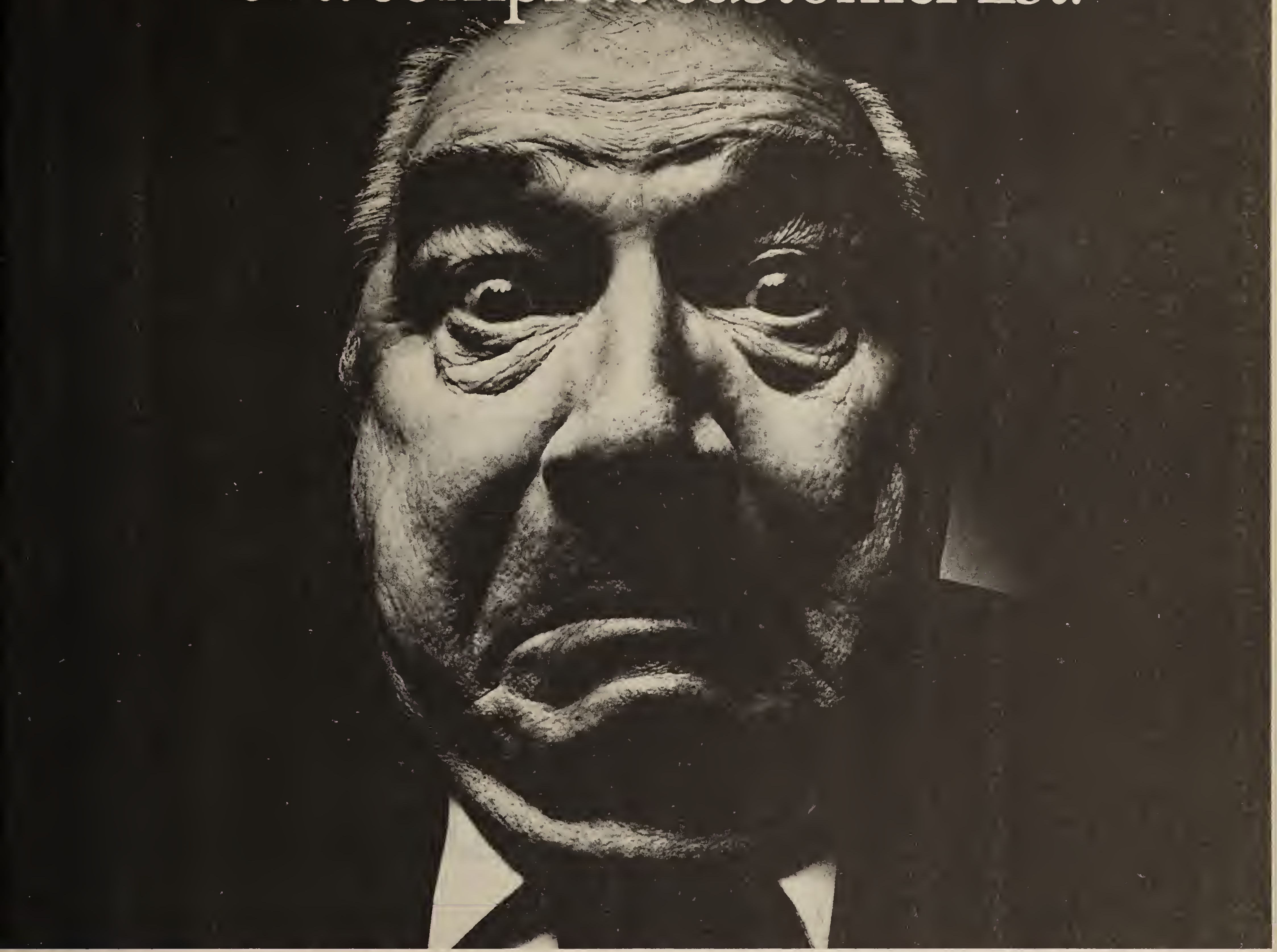
CLIP AND SEND!
It's about time I leave the nest, also. Please send me more information.

Name ______
Company ______
Address ______
City ______
State ______ Zip ______
Phone ______

TRW Customer Service Division
Dept. 845, 15 Law Drive
Fairfield, NJ 07006
C-6/87

© TRW Inc. 1987 TRW is the name and mark of TRW Inc.
IBM is a trademark of International Business Machines Corporation

Watch what happens next time you ask a mainframe software vendor for a complete customer list.



You may get a convincing song and dance, but underneath it's a different story. Behind those pat answers that software vendor is actually sweating and squirming.

Why don't they want you to see a complete list? Simple. They know that their size and name familiarity do not guarantee happiness. Many "single source" or "all-things-to-all-people" vendors have, at best, uneven quality across a multi-application product line. They know that their customer list may contain a good number of less-than-happy clients. It's difficult for these vendors to commit the human and monetary resources necessary to produce the type of superior product available from a firm that specializes in a single application area. A firm like Data Design.

Data Design develops mainframe financial applications software. Period. We understand all our users' requirements and are therefore able to provide the necessary support: over 40 percent of our support and installation staff are CPA's or have MBA's.

Data Design doesn't balk at giving prospective customers a *complete* customer list. That's because hundreds of FORTUNE 1000 companies have reaped exceptional results from our financial software systems. Alcoa, Gerber, Pillsbury, Sherwin-Williams, Merrill Lynch, Bankers' Trust, Bristol-Myers, Federal Express, Litton, Lloyd's Bank, The New York Times Company, Owens-Corning, Royal Business Machines, Warner-Lambert and hundreds more have opted for Data Design over other major vendors. Write for our complete customer list and ask *anyone* on it about our fast, trouble-free implementation; system flexibility and ease of use; in-depth training and responsive, knowledgeable support; *management level* people in customer service positions, and more.

You'll find that people who want financial software relief choose Data Design. Since 1973, nationally recognized independent software surveys have confirmed Data Design's unsurpassed record of user satisfaction—year after year. That's why we'll give you a complete customer list—and *they* won't.

So, if you're in the process of looking at mainframe financial software for your company, put Data Design on your list. Then tell the other vendors on it you're also looking at Data Design. And watch what happens.

Financial software by Data Design. Simply the best.

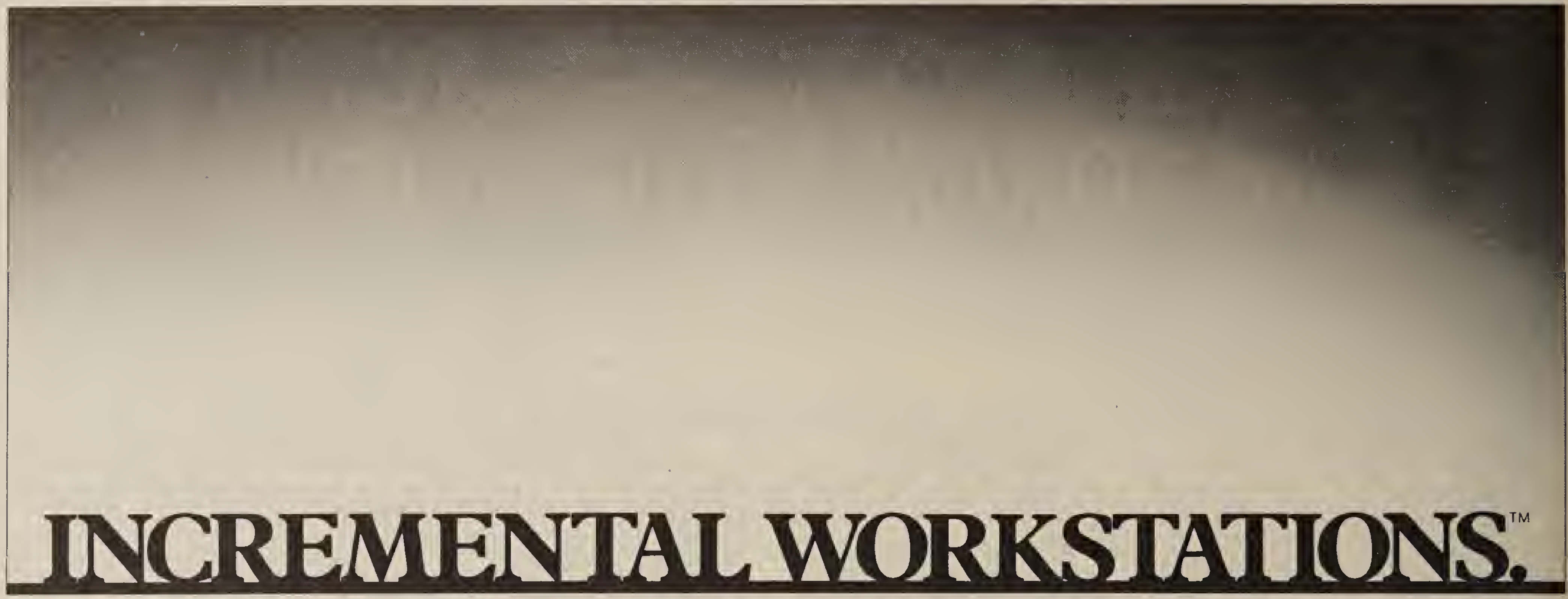
GENERAL LEDGER
ACCOUNTS PAYABLE
PURCHASE ORDER CONTROL
FIXED ASSETS
PROJECT ACCOUNTING SYSTEM

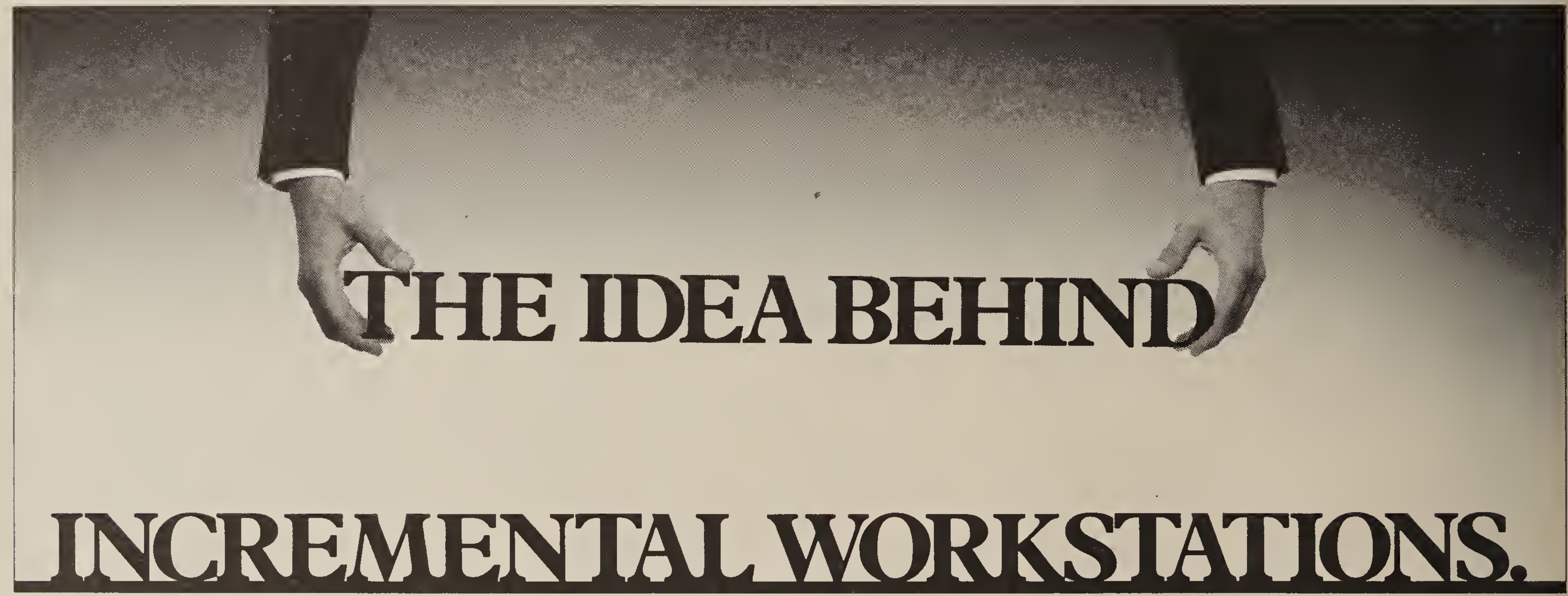
Learn more about the best financial software available, call Betty Fulton toll-free at 800-556-5511 today.

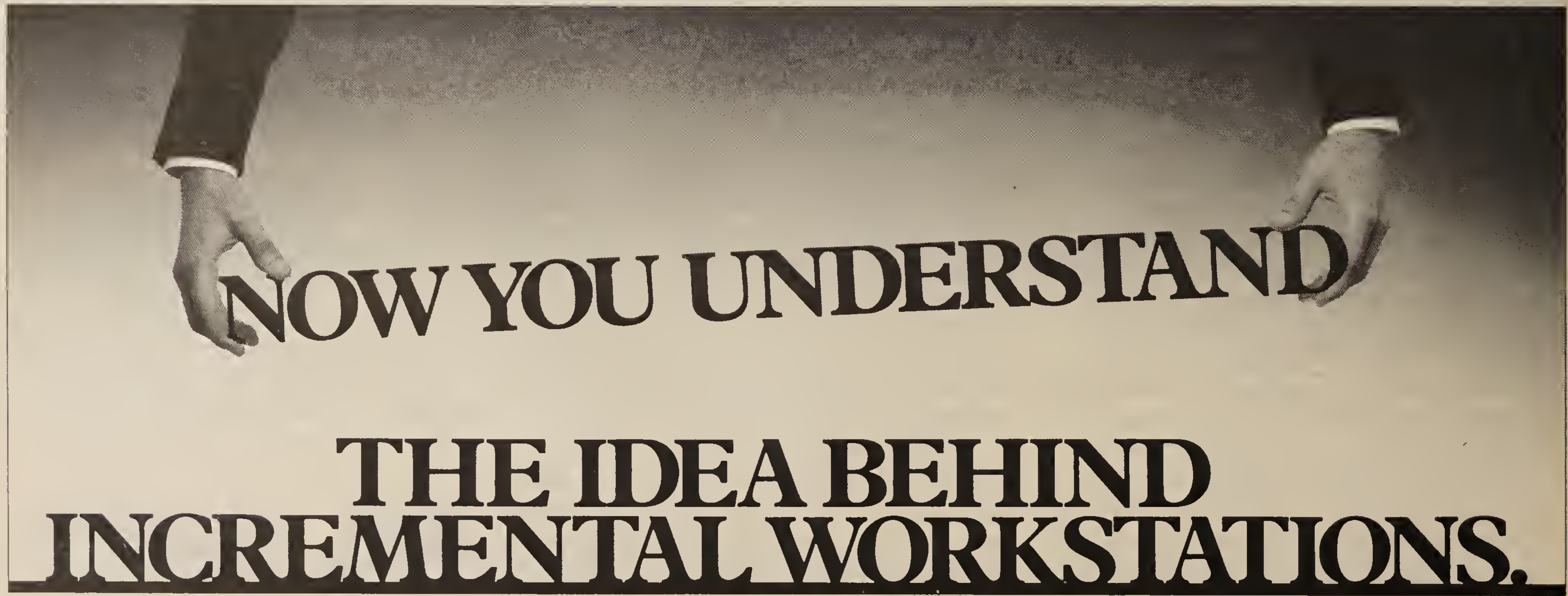
DATA DESIGN
ASSOCIATES

Excellence in financial software. By design.

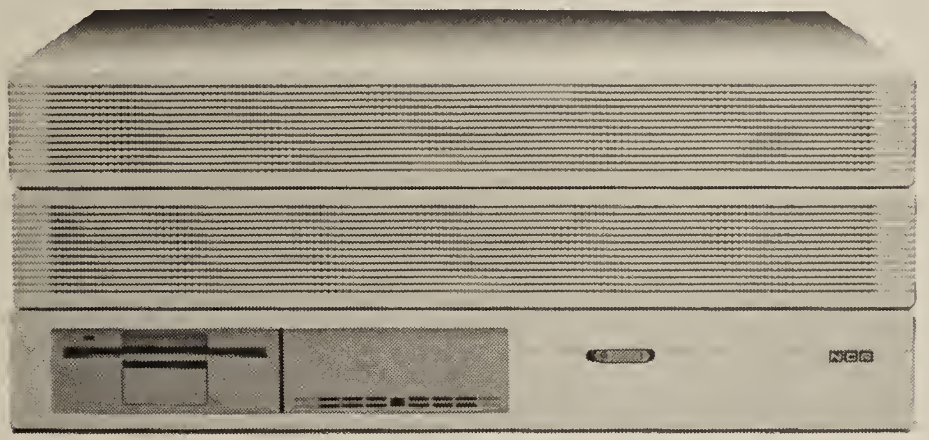
1279 Oakmead Parkway, Sunnyvale, CA 94086


INCREMENTAL WORKSTATIONS.™


THE IDEA BEHIND
INCREMENTAL WORKSTATIONS.


NOW YOU UNDERSTAND
THE IDEA BEHIND
INCREMENTAL WORKSTATIONS.

Presenting NCR Incremental Workstations.



With incremental systems, like our new NCR 3392 Workstation,™ you choose exactly the functionality you need. No more. No less. You can start small, then upgrade or change your system increment by increment, module by module.

Whenever you need more power, memory or storage.

It's an idea whose time has come. And not a moment too soon.

A computer system inspired by the long-term needs of computer users. Not just computer makers.

Built around industry standards for hardware and software.

Dedicated to communications and networking.

Tailored to your specific needs.

But with the flexibility to change tomorrow.

Without sacrificing the computer investment you made yesterday.

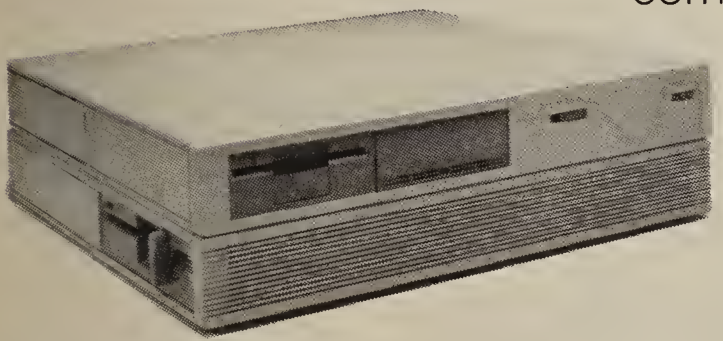
In short, a new kind of open system.

Of which the new NCR family of workstations, PCs and communications products is the perfect example.

You can really grow attached to our incremental workstations.

With a whole line of NCR communications products designed to bring the pieces together. Like our industry-compatible NCR PC Token-Ring System.™ SNA software. Communications Adapters. And more.

All of which work with industry standard protocols.



NCR gives you the best of both worlds.

All of our new products, like the layered, general-purpose PC710,™ offer you a choice of 3½" or 5¼" disk drives.

We even let you have both in the same machine.

So you can run both formats of software. Without special adapters.

Far from ordinary boxes, NCR workstations come in modular "building blocks." Each containing compact logic cards (shrunk down to size by VLSI and surface mount technology), storage devices or expansion slots that you mix and match to your requirements.

You start with what you need. Then change, modify or expand your system at your own pace. Piece by piece.

Allowing you to keep your system current with the latest industry standards. No matter when they change.

We offer a whole family of solutions. Add-ons to complete systems. General purpose PCs. Communication workstations. And communication products.

Whatever you buy, you're buying planned non-obsolescence.

From a $4.9 billion company that's committed to open systems. A commitment that comes standard with every product we make, from the smallest workstation to the biggest mainframe.

So now that you understand the idea behind NCR incremental systems, you can see that the future of computing lies in pieces.

Our NCR PC810,™ an AT-compatible 286 PC, turns into a 386 PC with the addition of a CPU card and memory card.

The NCR PC916,™ a 386 PC, will upgrade the same way. As soon as someone invents a more powerful chip.

NCR

A Smart Foundation To Build On.

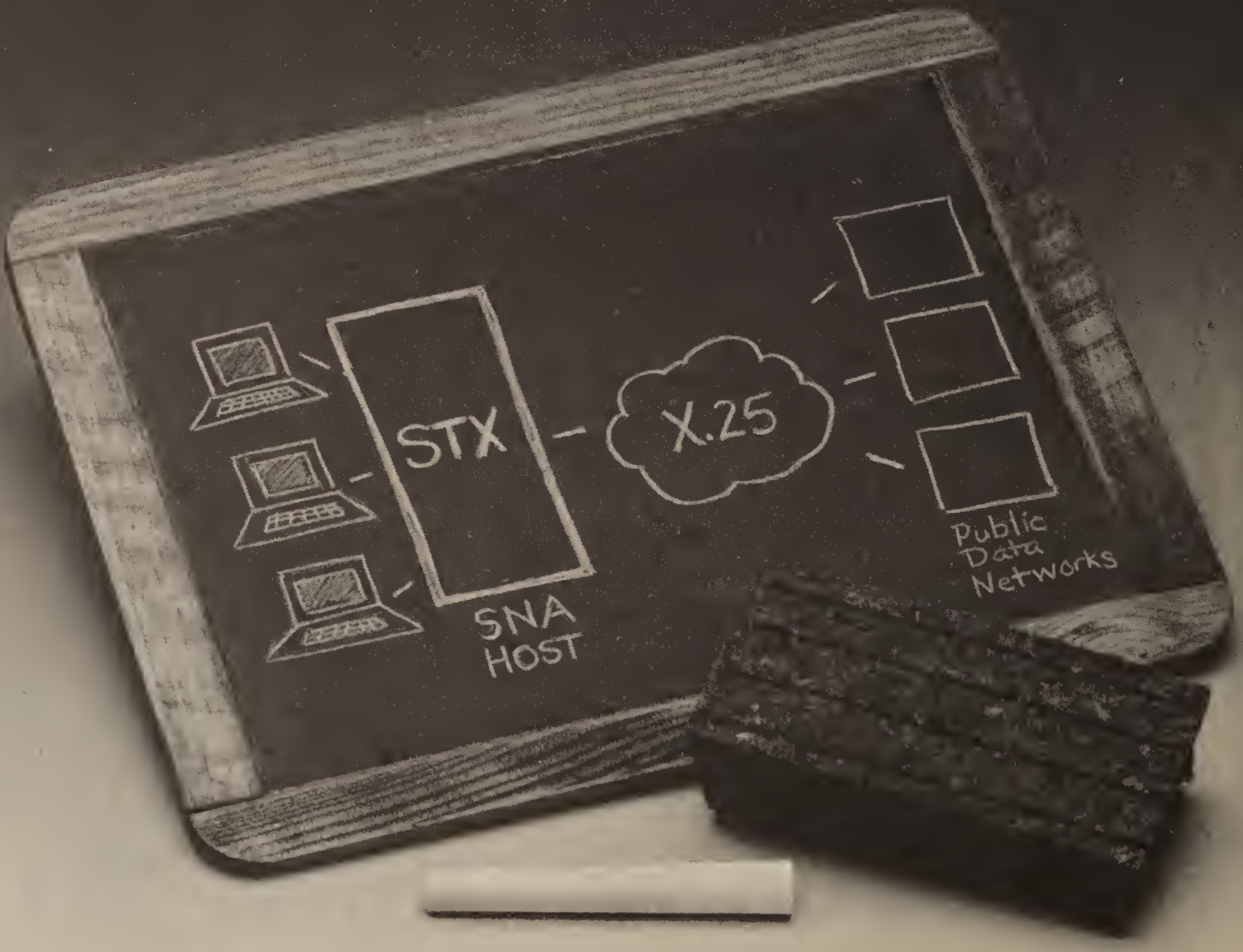
NCR Corporation, Personal Computer Division, Dayton, OH 45479 For more information, contact your local authorized NCR Reseller or local NCR sales office

© 1987 NCR Corporation NCR PC Token-Ring System Incremental Workstations, 3392 Workstation, PC710 PC810, and PC916 are trademarks of NCR Corporation

A Lesson in Accessing Public Data Networks

There's an easier, more cost-effective way to connect SNA and X.25 networks. We call it STX (SNA To X.25)—a host-based software package from Duquesne Systems that provides a common access point to public and private data networks for 3270 users. Users select the desired application from a full screen menu, and connect procedures are automatically performed by STX instead of the user. Session scrolling, data capture, file transfer, and script facility all help to improve the efficiency of your system and productivity of the user. Using this central point for access also allows site administration to completely monitor and control X.25 resource usage.

To learn more about STX or to arrange for a FREE 30-day trial, please call us today at 1-800-323-2600.



DUQUESNE SYSTEMS

Duquesne Systems Inc. • Two Allegheny Center • Pittsburgh, PA 15212 • (412) 323-2600

SMALL TALK

William Zachmann

Demystifying the desktop

Desktop publishing has been one of the major buzz phrases of the past year. Consultants have conducted conferences on desktop publishing. Magazines have been launched devoted to it. It has even been acclaimed by some particularly eager enthusiasts as the key to renewed industry growth.

With all this hullabaloo, one could easily get the impression that desktop publishing is some arcane, mysterious art. After all, with so many experts, it's got to be awfully complicated, doesn't it?

No, it doesn't. At least, not if you go at it with a program like Ready, Set, Go from Paramus, N.J.-based Esselte Letraset USA. Easy to understand, learn and use, Ready, Set, Go for the Apple Computer, Inc. Macintosh takes the mystery out of desktop publishing.

Desktop publishing simply amounts to combining text, graphics, pictures and the like to produce nicely laid-out pages. To do that, you simply need a system with a high-resolution dot matrix or laser printer and

Continued on page 44

Wang clones PCs, forges VS link

BY ED SCANNELL
CW STAFF

LOWELL, Mass. — Wang Laboratories, Inc. has introduced its first fully IBM-compatible series of microcomputers that have all the workstation functionality of and connectivity to its VS series of minicomputers.

Called the Professional Computer 280 and 380, the two systems are targeted at Wang's largest corporate accounts looking to integrate workstations with both departmental and corporate computers.

The machines began shipping prior to announcement. The products, which feature high-resolution graphics, reportedly will also be marketed as desktop publishing systems.

"We think it [the Professional Computer 280 and 380 series] puts to rest once and for all any doubt as to whether or not Wang is committed to industry standards," said Win Burke, director of desktop systems.

The Professional Computer 280 is centered around an Intel Corp. 80286 processor, while the Professional Computer 380 is powered by an Intel 80386 processor. Both systems are bundled with Microsoft Corp.'s MS-DOS 3.2 and Windows operating environment. They run all software compatible with IBM's Personal Computer AT as well as industry-standard versions of Wang-developed applications, including its version of Aldus Corp.'s Pagemaker.

Each system comes standard with an eight-slot chassis, a 1.2M-byte disk drive, a disk controller that supports up to two disk drives and a multimode video controller that supports Hercules Computer Technology, Inc. monochrome graphics and IBM's Color Graphics Adapter and Enhanced Graphics Adapter.

The two systems also use the same monitors, keyboards, option cards, printers and disk drives. Professional Computer 280 users can upgrade to the Professional Computer 380 by replacing their system board with that of a Professional Computer 380.

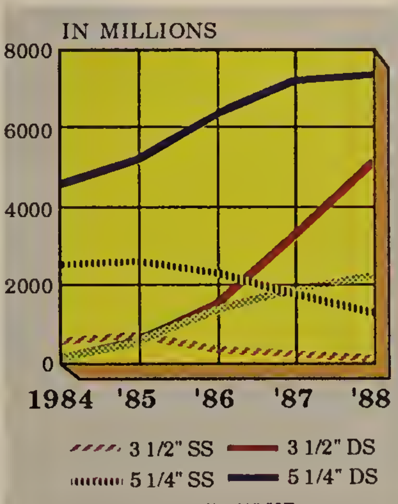
Through the Wang Local Of-

Continued on page 43

Data View

Personal computer forecast, 1984 to 1988

Worldwide shipments by floppy drive technology



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: SUSAN ALDAM

Publishing need modest

Study says ballyhoo surpasses demand

BY PATRICIA KEEFE
CW STAFF

TEMPE, Ariz. — The actual demand for desktop publishing in the corporate market "cannot justify the current level of media hype," a recent study from The Sierra Group found.

The market for desktop publishing equipment is significantly smaller than markets for word processing, data base management, spreadsheet and graphics applications, says Sierra Group Vice-President Marty Gruhn. "It is simply not the 'revolution' which all the media hype would indicate is taking place."

Gruhn predicts that the demand for desktop publishing systems will be brief and intense as systems are installed in publication-oriented departments and small companies seeking to provide a "bigger than reality" image. "After that, market penetration will quickly ensue and vendor shakeouts will follow," she adds.

Several vendors have failed to capitalize upon their early presence in the desktop publishing market, while others are missing the demand for desktop publishing within their own installed bases, Gruhn says. "Xerox Corp., for example, is lagging well behind Apple Computer,

Continued on page 43

Tracker trails PC inventory

BY DAVID BRIGHT
CW STAFF

Little more than a year ago, the National Bank of Georgia in Atlanta kept its inventory of personal computer equipment on a small data base management program written in-house. Purchasing information was not automated at all.

"There was a little, tiny [data] base system that somebody had written, but it wasn't really a good inventory system. Nobody had kept it up," recalls information center manager Chuck Ippolito, who is charged with keeping track of more than 100 systems plus related hardware and software equipment. "Purchasing was just on pieces of paper. We had a lot of items being purchased, and it was a real mess trying to keep things straight, such as finding out which orders hadn't come in yet."

To help keep better track of the equipment, Ippolito bought a package called PC Tracker from

Continued on page 44

Inside

- Sytron unveils DC2000-compatible tape operating system. Page 42.
- Microsoft heralds mouse with PS/2 version. Page 46.
- Ibase releases data and text recognition system. Page 48.

Memory-resident SQL engine targets MIS users

Firm says XDB II meets full ANSI standard, is DB2 compatible

BY DOUGLAS BARNEY
CW STAFF

COLLEGE PARK, Md. — A memory-resident microcomputer SQL engine that is said to be compatible with IBM's DB2 mainframe data base is scheduled to be unveiled next week by Software Systems Technology, Inc. (SST).

The product, XDB II, is based on the original XDB, an SQL-based data base that is licensed for use in Applied Data Research, Inc.'s (ADR) local-area network (LAN) data base system.

ADR's license also allows the firm to incorporate XDB technology in mainframe, LAN and personal computer environments. XDB II is scheduled to be unveiled at the Comdex/Spring '87 show in Atlanta, according to the vendor.

For DP professionals

XDB II is aimed primarily at MIS/DP users with experience in data base and SQL technology. "We targeted this product at the data processing professional," said S. Bing Yao, founder of SST.

According to Yao, the most important aspect of XDB II is its 100% compatibility with the American National Standards Institute (ANSI) SQL standard, along with its compatibility with IBM's DB2.

But while XDB is compatible with DB2, there is still work to be done.

"We are not yet providing transparent access to DB2. We have a product that will be released late this year, however, that will provide transparent access," Yao said. "It will be a truly distributed system, so you can access mainframe data without really knowing where it is."

LAN version offered

A LAN version of the product with automatic record locking will also be offered. "You can build, for example, an order-entry system that services five clerks, all accessing the same data base," Yao said.

Another key feature, according to Yao, is that XDB II only takes up 200K bytes of random-access memory, therefore providing more room for applications.

"Also, because the system is memory resident, you can interface it with any programming language," Yao said. "We already have a Cobol preprocessor interface and a Turbo Pascal interface in the works."

In addition to the data base engine, SST will offer several menu-driven application generation tools, including a forms manager, report writer, menu generator, import/export facilities and a procedural language.

Most of these tools are aimed at limiting the need for a procedural language in developing applications.

Highly portable

XDB is written in C and as a result is highly portable, the firm claimed.

SST said it will make object- and source-code licenses available to interested parties.

The vendor said XDB II will sell for $395 for a single-user version and $995 per network for a LAN version.

SST said the LAN version runs on any LAN that is compatible with IBM's PC-DOS or Microsoft Corp.'s MS-DOS 3.1, such as Novell, Inc.'s Advanced Netware, and 3Com Corp.'s 3Plus.

How to keep up with

"This is a true multiuser database. When we saw the automatic screen updating, you could've scraped our jaws off the floor."

Jim Reichel
Atlantic Business Systems

"Paradox 2.0 is a big step in making databases accessible to normal folk."

David Schulman
Bendix Aerospace

"Paradox 2.0 should make 1987 the year of the network."

John F. McMullen
McMullen & McMullen

"From a standpoint of ease of use, concurrency and performance, Paradox 2.0 redefines the meaning of 'multiuser'."

Bob Metcalfe
3Com Corporation

"It answers our wish list, providing a painless way to go from single to multiuser applications."

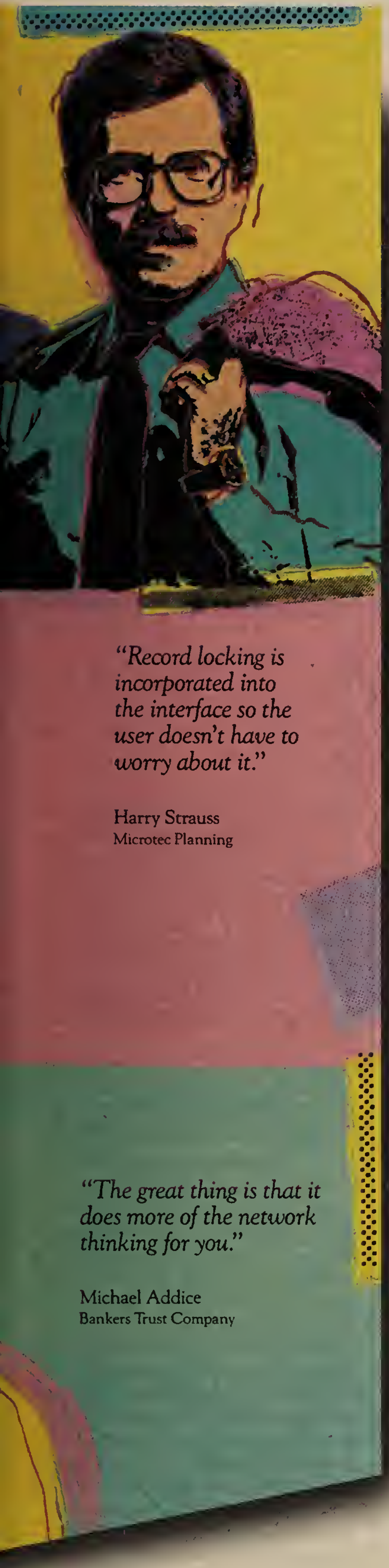
Barry L. Smith
Elf Aquitaine

"The multiuser capabilities are transparent. It adapts to your needs."

Glen Herbert
Lydall, Inc.
Technical Papers Division

©1987 Ansa Software. Paradox is a registered trademark of Ansa Software. Lotus is a registered trademark of Lotus Development Corporation.

concurrent events



"Record locking is incorporated into the interface so the user doesn't have to worry about it."

Harry Strauss
Microtec Planning

"The great thing is that it does more of the network thinking for you."

Michael Addice
Bankers Trust Company

Introducing Paradox 2.0. More power for single users, unparalleled power for multiple users.

New Paradox® 2.0 puts the power of the emerging relational database standard into everyone's hands. Single users and multiple users. Now everyone you work with can share information in a way that no other multiuser PC database can offer.

For single users, Paradox 2.0 improves the standard that Paradox 1.1 set for ease of use, speed and power.

For multiple users, Paradox 2.0 offers that same performance plus the unequaled ability to edit, browse, query, sort and report a file concurrently—to get information in real time.

Same time, same network

The multiuser capabilities of Paradox work like an airline reservation system, where people share and update information constantly. Without getting in one another's way. This transparent, concurrent data sharing lets users do things that are impossible in other PC databases.

For example, other databases often lock entire files, or else lock records in a way that makes the data below inaccessible.

Paradox 2.0, on the other hand, lets users edit, browse, query, sort and create reports in the same file at the same time. Records lock automatically, telling others the user's name, and leaving the data below accessible. When revisions are made, the changes appear on all screens in real time. Or at an interval you set. With all these features, Paradox helps more people get more done.

This performance comes without the noticeable speed loss that plagues most multiuser databases. But advanced multiuser capabilities are just some of the enhancements in Paradox 2.0.

Expanded coverage

Paradox has kept its familiar Lotus®-like interface and artificial intelligence to simplify operation and hide complexity from the user. On top of this, we've added more performance for single users, new users and application developers.

Our intuitive "query by example" now has a "Zoom" command that pinpoints data faster. We support up to two billion records, plus EMS and EEMS to speed processing of your largest applications.

Reports have new features like word wrap and multicolumn mailing labels. And thinking ahead, we offer both 3½- and 5¼-inch diskette formats.

For new applications, Paradox 2.0 is also a more powerful tool. We've added 48 new Paradox Application Language commands and functions, sample programs, a data entry toolkit and other helps—many to speed multiuser application development.

Eyewitness report

Study these current events and it's not surprising that companies like American Airlines, First Boston and Mass Mutual are standardizing on Paradox. Not for one reason, but for many.

That's why we're taking new Paradox 2.0 on a cross-country tour, so you can get the firsthand story on the future of multiuser relational databases.

For seminar reservations, call 415-595-4618, extension 155. For an Ansa dealer who can give you a free demonstration diskette, call 1-800-447-4700, Department 252. In the U.K., 01-580-4766.

PARADOX
by Ansa

Spelling checker for 1-2-3, Symphony bows

BY ED SCANNELL
CW STAFF

CUPERTINO, Calif. — Turner Hall Publishing recently released an add-in spelling checker for Lotus Development Corp.'s 1-2-3 and Symphony that the firm said uses an electronic linguistic processing technology developed by Borland International.

Called Spellin, the program enables users to check a particular cell, range of cells or an entire spreadsheet, a spokesman said.

When an incorrect spelling is found, a list of similar alternative words is generated so users can select the correct word.

"There is more emphasis on the professional appearance of formal documents. As a result, typing and spelling errors are tolerated less and less," said Tom Byers, general manager of Turner Hall.

'Convenient spelling check'

"Spellin is the only product that provides users with a convenient way to check the spelling of their spreadsheets."

Spellin gives users a choice of either an American or British English dictionary, with each version containing approximately 90,000 words.

Dictionaries for specific professions such as medical, legal and business can be created, as well as dictionaries for individual businesses, according to a company spokesman.

Narrowing it down

In selecting Borland's linguistic technology, Byers said the company had evaluated several available technologies but decided on Borland's because "our analysis showed that Borland's technology was best suited for our product."

Spellin, which can be loaded and unloaded from random-access memory (RAM) without exiting 1-2-3, is compatible with IBM's Personal Computer and compatibles and requires 95K bytes of RAM.

It is also compatible with Borland's Sidekick and various expanded memory boards.

July ship eyed

Turner Hall said the company expects to ship Spellin in July at a suggested retail price of $79.95.

Besides Spellin, Turner Hall also unveiled a follow-up to Note-It, a professional notation system for 1-2-3 users, called Note-It Plus.

In addition to allowing users to attach notes to any file name and any cell in a file, the program lets users browse, link, search or copy and paste information in notes.

Sytron targets Irwin drives

MARLBORO, Mass. — Sytron Corp. has released a version of its SY-TOS tape operating system for Irwin Magnetics Systems, Inc.'s DC2000 series of tape drives.

The company said it also intends to make SY-TOS compatible with tape drives made by Archive Corp., Alloy Computer Products, Inc., Mountain Computer, Inc. and Wangtek, Inc.

The DC2000-compatible version of SY-TOS will provide users with an interface for all their tape backup applications, whether they are backing up a hard disk onto floppy disks or higher level streaming tape drives, a spokesman said.

The SY-TOS system includes SY-Clock, a utility that supports unattended backup as well as timed operation of any program based on Microsoft Corp.'s MS-DOS or IBM's PC-DOS.

The Irwin-compatible version of SY-TOS is priced at $99.95 and is slated to be available directly from Sytron beginning at the end of July.

Okidata lowers Laserline prices

MT. LAUREL, N.J. — In an attempt to become more competitive, Okidata has reduced the price of its Laserline 6 page/min. laser printer by 10%, to $1,795.

The Oki America subsidiary also cut the price of its Hewlett-Packard Co. Laserjet Plus emulation module to $200 from $400 and introduced an option, priced at $600, that enables up to three users to share a print station. With the Laserjet Plus emulation and the three-port option, three users can share a Laserline for $800 each, Oki said.

The three-port option will be available later this month, according to Oki, and will be offered in parallel or serial RS-232C interfaces.

The price reduction on Laserline came days before C. Itoh Digital Products, Inc. in Irvine, Calif. introduced the Jet-Setter, a 5 page/min. laser printer with built-in Laserjet Plus-emulation capabilities that also lists for $1,795 [CW, April 27].

Oki has shipped more than 5,000 Laserlines since the product's introduction last September.

Which way wo
learn about text ma

On your own?

For years text management has hovered on the outer fringes of MIS consciousness.

Which is strange, considering how important it is to some of the key people MIS has to serve.

Like company attorneys faced with an unexpected lawsuit.

It's at times like these that text management software has proven its value in organizations all over the world—delivering benefits people didn't even know existed a short while ago, and creating a crescendo of demand at the very highest organizational levels.

What does this mean to you? Several things:

First, it means you'd better understand what text management is all about—before your users do. (Hint: if you're thinking "word processing," read on.)

Second, it means you'd better select a text management system with the features *users* need to obtain information—plus the features *you'll* need to maintain system integrity. Users need specialized text search and index facilities conventional DBMS's don't offer; you need database and system control facilities dedicated retrieval systems don't offer.

And third, it means you'd better start evaluating text management systems and vendors without delay. And there's no better way to begin that evaluation than by taking a close look at INQUIRE/Text—the most comprehensive, proven text management software system on the market.

Text management; It's not word processing. And it's not data management.

Traditional corporate information systems do a great job managing structured data. Unfortunately, the information most needed by decision-makers is often unstructured—embedded in the text of documents such as letters, memos, reports, contracts, and transcripts. Because this material has traditionally been beyond the reach of online systems, access to it has been slow, tedious, and error-prone. Word processors and other office automation systems have greatly accelerated document creation and distribution, but they are all but useless in making the actual information content of documents available as an online resource.

A text management system fills this need by providing highly sophisticated facilities for online index, search, and retrieval of information in stored documents. With a text management system, users at all organizational levels can pinpoint specific pieces of information within vast volumes of text—instantly. And once they've found the information, they can edit it, combine it, and report it out with complete flexibility.

Not surprisingly, the biggest text management system users have tended to be companies engaged in complex litigation or regulatory proceedings. But as text databases have proved their value in these initial applications, they have increasingly been used in others as well—from competitive intelligence gathering to online maintenance of technical documentation to a full array of corporate records management tasks. And as senior executives have become comfortable with text management facilities, they have increasingly mandated their use throughout the organizations that report to them.

The results: a dramatic improvement in the overall quality of information available to decision-makers. And a dramatic increase in pressure on MIS to deliver top-flight text management capability.

INQUIRE/Text: The features users need. The control you need.

As the demand for text management capability has grown, so has the number of vendors claiming to provide it. But few of these vendors offer the features, the flexibility, and the track record of Infodata's INQUIRE/Text.

INQUIRE/Text's automatic indexing and powerful keyword search and retrieval facilities have set industry standards in text management for years. INQUIRE/Text's easy-to-use menu screens, ability to handle both structured and unstructured fields, and flexible interfacing options have made it a hit with users in all departments, while also easing the tasks of the MIS personnel charged with implementing it. And INQUIRE/Text's track record in over $50 billion worth of litigation support applications—to say nothing of the rest—makes it easy to justify to top management.

INQUIRE/Text: It's the first thing you need to know about text management. ◆

INQUIRE/Text runs on IBM and compatible mainframes under MVS/TSO, MVS/CICS and VM/CMS.

Microsoft releases mouse tailored to PS/2

BY DOUGLAS BARNEY
CW STAFF

REDMOND, Wash. — Microsoft Corp. recently celebrated the shipment of its 500,000th mouse with the announcement of a new mouse specially tailored for the IBM Personal System/2 line of microcomputers.

The mouse supports IBM's new Video Graphics Array graphics standard and uses the IBM mouse port that is built into the PS/2 machines.

Many corporate users have shunned mouses, saying they believe mouses take up valuable desk space and are slow and cumbersome. And since most applications are character-based, mouses are simply not needed.

Rise in use of mouses

But according to Rich Abel, senior hardware product manager for Microsoft, the increase in the use of graphics software — and desktop publishing in particular — has stimulated the demand for mouses. Microsoft's research indicates that 81% of mouse owners use graphics software.

The need for mouses will again increase with the eventual release of the Presentation Manager, a derivative of Microsoft Windows that works with OS/2, IBM's and Microsoft's next-generation operating system that is scheduled for release next year.

Like Microsoft Windows, the Presentation Manager will run most effectively with the use of a mouse or other point device.

As with Microsoft's other mouse products, the two-button mouse, which sells for $175, comes bundled with Z-Soft Corp.'s Paintbrush program and Show Partner from Brightbill-Roberts and Company Ltd.

Both graphics packages have been upgraded to take advantage of IBM's enhanced graphics.

Wang clones PCs

CONTINUED FROM PAGE 39

fice Connection, a Professional Computer 280 or 380 can become a fully functional VS workstation, a spokesman said. In a basic configuration, each system contains one serial and one parallel port, a synchronous/asynchronous communications card and a variety of third-party system networking and terminal emulation software.

The Professional Computer 280 has enough capability to take care of the needs of most business users, Burke said. The Professional Computer 380 is a more appropriate choice for those using a microcomputer for desktop publishing or as a file server, he added.

The Professional Computer 280 and 380 each come in three different models with pricing dependent on the amount of storage capacity purchased. The Professional Computer 280 ranges from $3,850 to $4,875, while the Professional Computer 380 ranges from $6,495 to $8,495. Wang claimed to have already sold more than 4,000 units.

Wang officials said the Professional Computer 280 and 380 will complement, not replace, the company's Professional Computer and Advanced Professional Computer. They said Wang has an installed base of 400,000 microcomputers.

In addition to the two systems, Wang announced a laser printer that prints at speeds up to 15 page/min. and has a resolution of 300 by 300 dot/in.

Publishing

CONTINUED FROM PAGE 39

Inc.," Gruhn says. "More than 30% of Honeywell, Inc. users plan to buy desktop publishing, but most will opt for personal computer-based solutions. And Hewlett-Packard Co. is missing a fine opportunity to ship software to its base of nearly 300,000 laser printer users."

The Sierra Group's survey of 500 firms reveals that only about one in five (21.4%) intends to purchase electronic publishing systems this year. Of that percentage, the vast majority (71.6%) say they will purchase PC-based desktop publishing systems. Of those firms planning to buy desktop publishing products, 28% are users of Digital Equipment Corp. hardware.

The study categorizes market demand by the systems that will be targeted for desktop/electronic publishing and also identifies demand by geographic region, company size, vertical market and vendor preference. Spending for desktop publishing will be higher among companies in the West and Northeast regions of the U.S., following the pattern of most information systems equipment purchases.

The insurance industry currently represents the single largest market for desktop publishing (31.9%), followed by the financial (26.7%) and manufacturing (19%) markets.

Companies with annual revenue in excess of $1 billion represent the single largest target market for desktop publishing (23.7%), followed by those with revenue of $500 million to $1 billion (19.3%), $10 million to $50 million (17.3%), less than $10 million (13.5%), $50 million to $100 million (13.5%) and $100 million to $500 million (12.7%).

ld you rather
agement software?

Or from your
legal department?

Today's rising tide of litigation is placing extraordinary demands on corporate legal departments—forcing attorneys to prepare and manage cases of unprecedented volume, complexity, and public visibility.

In this environment, it's no wonder that so many legal departments are turning to computerized systems to manage critical aspects of their work. And one of the key functions they're looking for is the ability to perform fast, accurate online text searches—a function no system performs better than INQUIRE/Text.

INQUIRE/Text: Proven in companies—and in court.

INQUIRE/Text is a proven, cost-effective system that facilitates the full range of legal department activity—not to mention broader corporate information management strategies.

With INQUIRE/Text, the time and cost of document searches can be sharply reduced. Even more important, INQUIRE/Text can actually enhance professional performance—especially under severe case loads.

By enabling people to share updated information instantaneously, INQUIRE/Text facilitates the preparation of complex cases while minimizing the error potential associated with large volumes of paper documentation. And by tracking key events and costs, INQUIRE/Text contributes to improved efficiency without compromising the quality of service provided.

Equally important, INQUIRE/Text is a system proven in some of the most pressing litigation in American history. It's being used right now in the massive asbestos industry liability case. And it's been relied on for years in other cases ranging from antitrust to negligence—to administrative hearings before government regulatory bodies.

INQUIRE/Text: It's the system legal departments need. It's the system you need to know.

What works for attorneys can also work for MIS—and others.

You might expect a system as sophisticated as INQUIRE/Text to be difficult for non-DP-oriented users to master. But it's not. Even attorneys who are new to computers find INQUIRE/Text easy to learn and quickly habit-forming. As they become more experienced, they soon discover additional capabilities that can materially enhance their ability to make and present decisions and opinions.

But attorneys aren't the only ones who benefit from INQUIRE/Text. The very features that make INQUIRE/Text so ideally suited for legal applications also serve the needs of other departments such as planning, marketing, regulatory affairs, the library—and not least of all, MIS itself. In fact, INQUIRE/Text is a perfect system for the online maintenance of a wide variety of technical documentation. With its large capacity and flexible database facilities (including automatic backup and recovery, usage monitoring and accounting, and multilevel security), INQUIRE/Text protects the organization's interests while serving the individual.

This ability to meet both MIS and end-user needs is no accident—it was designed into INQUIRE/Text from the start. Which is one more reason why INQUIRE/Text is the place to start your investigation of text management software.

Speaking of which: if you've read this far, you probably know as much about text management as your law department does. So if they start presenting a case for text management, you've already got a case to present in return. A case for INQUIRE/Text. ◆

**INQUIRE®/Text:
Text management that
works for the legal department.
And for MIS.**

INFODATA®

Infodata Systems Inc.
5205 Leesburg Pike
Falls Church, 22041
(800) 336-4939
In Virginia and Canada,
call (703) 578-3430.

Get the rest of the evidence.

I'm interested in INQUIRE/Text. My application is ______________.

Name ______________

Title __________ Company __________

Address ______________

City __________ State ____ Zip ______

Phone ______________

Machine/operating system environment

CPU model ______________

☐ MVS/TSO ☐ MVS/CICS ☐ VM/CMS

INQUIRE and Infodata are registered trademarks of Infodata Systems Inc. INQUIRE is covered by U.S. Patent Number 3670310.

Tracker

CONTINUED FROM PAGE 39

RG Software Systems, Inc. in Fort Washington, Pa. "The first thing we did was put all of our new purchases on it," he explains.

Ippolito's next step was to take a physical inventory, key the information into Ashton-Tate's Dbase III, create an ASCII file and import it into PC Tracker. That process "worked like a champ," he says.

In addition to keeping track of inventories and purchasing, Ippolito says, PC Tracker is very useful for such jobs as handling equipment changes within and among departments, tracking down warranties on failed equipment and keeping track of which users should be notified about software upgrades for particular programs.

And, of course, "From time to time, we have to tell our management how much money we're spending" on various equipment; PC Tracker gives the necessary totals, but some of the reports are "fairly limited," Ippolito says. He occasionally uses the program's ASCII file-export facility to send the information to Dbase III for the production of more sophisticated reports.

Ippolito says he uses the program nearly every day and is in the process of using the program to group all equipment according to machine configuration. That way, he can get a listing of what goes with each individual system.

While Ippolito uses PC Tracker with Dbase III, some managers use it on a stand-alone basis. For more than a year, California's Department of Corrections in Sacramento has been using it on a stand-alone basis to keep track of a PC base that has grown to 500 systems. Prior to buying the program, PC consultant Karen Gonzales says she had a hard time tracking the equipment because no inventories had been kept.

Things are much easier now. "Everything is right there at my fingertips," Gonzales notes. "As new equipment comes in, I add it to my inventory and print out a list; and I can give my boss an account of how many computers are out there. I can get reports by division or by site."

Demystifying

CONTINUED FROM PAGE 39

software like Ready, Set, Go.

Essentially, what desktop publishing software must do is provide tools for conveniently arranging objects on paper. The two most basic types of object are text and pictures, including graphs. A third category includes various lines, boxes and circles that can be used for framing or setting off text and pictures.

Ready, Set, Go provides tools for manipulating these categories of objects on pages of a document to be printed. A fourth class of objects — the shape and properties of the space on the pages of the document — is equally important, however.

A scheme of design grids is one of the keys to Ready, Set, Go's ease of use. The space on the page to be laid out can be defined as a matrix of blocks, which can be selected individually or in combination with others. Most typically, these will be used to create text columns and to size pictures to fit into those columns.

The number, size and spacing of blocks that make up a design grid can be selected from one of eight standard options or can be created by the user. Text blocks and pictures can easily be aligned with the design grid chosen. They can also be placed anywhere on the page, regardless of the design grid, if the user so chooses.

The use of design grids in Ready, Set, Go greatly simplifies page layout for the user. The facilities for manipulating the three primary classes of objects on the page make use of the design grids to simplify things for the user.

For example, in laying out text columns, one simply uses the text block tool to create blocks of text aligned with the design grid. Then a text linker tool is used to tell Ready, Set, Go which text blocks are to be linked and in what order.

Text manipulation facilities include all the usual font and style options familiar to Macintosh users. Ready, Set, Go also includes a quite powerful text editor and substantial additional text format capabilities.

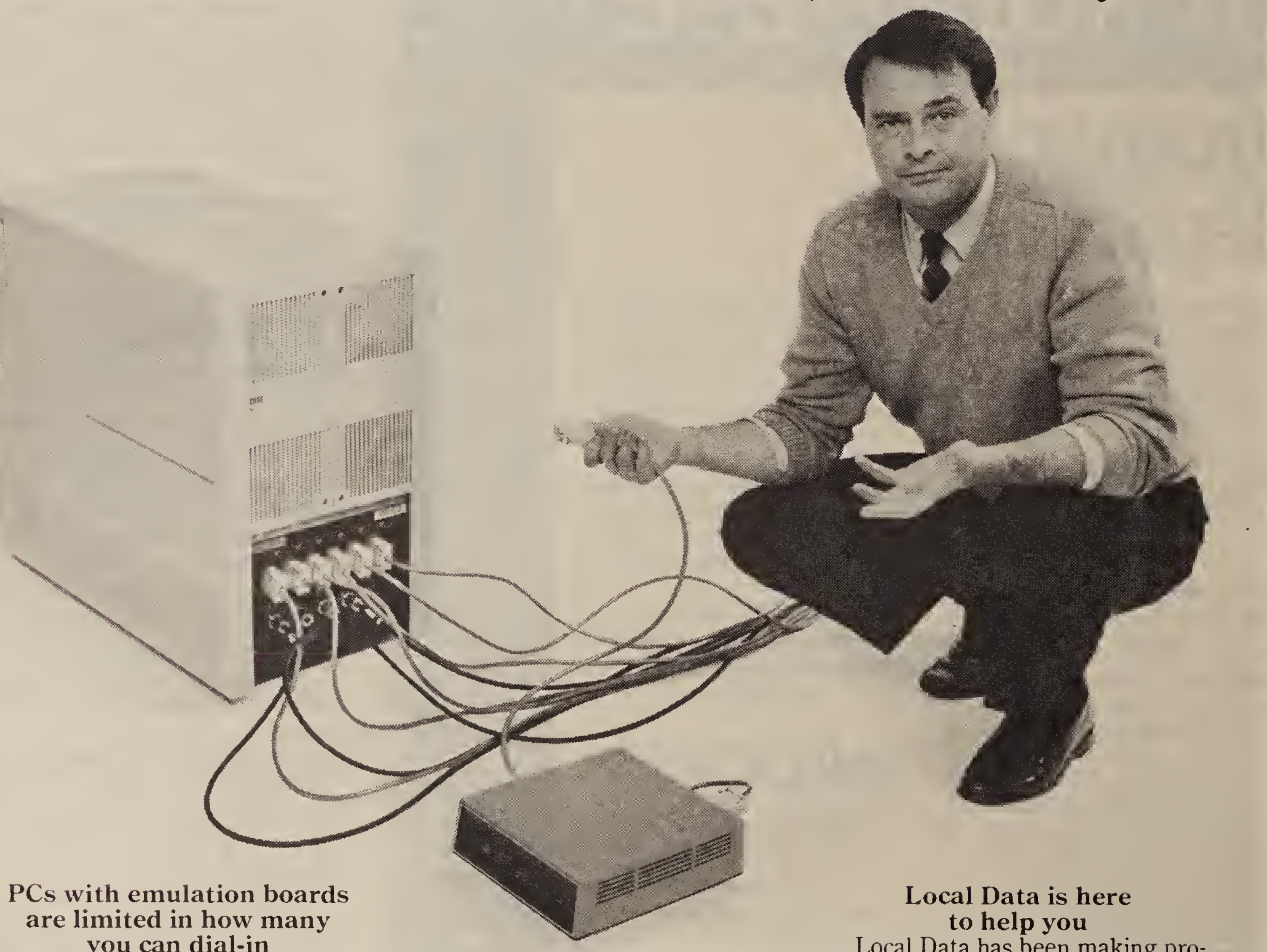
Control of text's appearance

Hyphenation, spell checking and a number of other features are built into Ready, Set, Go. In addition, the user has considerable control over how the text looks. Kerning and letter spacing (controlling spacing between letters in a way that takes the shape of the letters into account) as well as baseline shifts (vertical adjustment of the position of individual letters) are provided.

Also, when working with an output device like the Apple Laserwriter with driver Versions 3.1 and later, Adobe Systems, Inc. Postscript command programs can be directly embedded in the Ready, Set, Go document. This makes the full power of Postscript format programming available through Ready, Set, Go.

Apple's Macintosh has a well-deserved reputation for being an excellent vehicle for desktop publishing. Letraset USA's Ready, Set, Go is a remarkably straightforward and easy-to-use program that can only serve to enhance the Mac's acclaim in this area.

Zachmann is vice-president of research at International Data Corp.



Have more Dial-In PCs than your System/3X can handle?

Dial-in more PCs on the twinax channel, and save money!

PCs with emulation boards are limited in how many you can dial-in
With emulation boards, each PC takes up one comm line while dialing-in. When you run out of comm lines, you can't dial-in any more PCs. Period. Local Data's InterLynx™/5251 directly attaches to the twinax channel so you can dial-in up to 7 PCs on the same port!

Dial-in on the twinax channel without a board
By not using a board, you don't pay the high cost for comm ports, a comm adapter, or comm overhead on your System/3X. With TruLynx™/5251-PC software running on your PC, you can dial into the twinax and use less expensive asynchronous modems, too. TruLynx is a software product, so it's easy to install, and doesn't take up a valuable PC board slot.

File transfer compatibility with PC Support/3X or FSU
TruLynx allows you to transfer files to and from the System/3X with PC Support/3X and FSU. You can work with host data in your favorite PC application, like Lotus 1-2-3®

Local Data makes dial-in easy, and protects you from accidental disconnection
TruLynx gets you into the System/3X easily with its auto-dial and auto sign-on capability. Once online, if you are accidentally disconnected, InterLynx maintains your host session until you dial back. If you happen to walk away without signing off, InterLynx has an optional inactivity disconnect so phone bills don't eat up your budget.

Local Data is here to help you
Local Data has been making protocol converters for 8 years, and our data communications expertise just can't be beat. We even have a 24-hour on-line computerized help desk, just because your questions may not come during business hours.

Give us a call
Give us a call, we'd be happy to send in a rep to demo what our combination can do for you. And all your users. Call Local Data at (213) 320-7126. In Canada, call 1-800-267-1821, in the UK call 44-753-76537.

LOCAL DATA
2771 Toledo Street
Torrance, California 90503
(213) 320-7126
TLX 182518

InterLynx and TruLynx are trademarks of Local Data, Inc. Lotus 1-2-3 is a registered trademark or Lotus Development Corporation

Diagraph®
Windows

☐ Mr.
☐ Ms.

Name
Title
Company
Address
State/Province
City
Country
Zip/Postal Code
Telephone

ATTACH BUSINESS
CARD HERE

For more information mail this card today!

Only Diagraph offers you 5,000 high-quality symbols, dozens of typefaces, optional libraries, custom symbols and company logos.

29.6.1.87

No postage
necessary
if mailed in the
United States

Business Reply Mail

FIRST CLASS PERMIT NO. 312 CARROLLTON, TEXAS

Postage will be paid by addressee

Computer Support Corporation
Attn: Marketing Communications
2215 Midway Road
Carrollton Texas 75006-9990

Diagraph® Windows

Combine presentation graphics with word processing and desktop publishing.

If you need to create illustrations, diagrams, maps and flow charts for desktop publishing applications, the Windows version of *Diagraph* does it all.

Unlike the typical paint program, *Diagraph* does not expect you to be an artist. *Diagraph* comes complete with over 2,200 pre-drawn images and symbols.

Size, Stretch and Rotate

Diagraph images are drawn by professional artists, converted to mathematical equations and stored as numeric data rather than bitmaps.

Not only is this technique a more efficient way of storing objects but you can size, stretch and rotate them without affecting the quality of the image.

Draw Your Own

Of course, if you want to draw your own symbols, you can use the optional symbol editor to trace scanned images, modify existing symbols or construct complex illustrations.

Cut, Copy and Paste

Using cut, copy and paste commands, artwork created in *Diagraph* can be incorporated in any of the popular word processing and desktop publishing products that support Windows or Windows metafiles.

Special Offer

If you buy the Windows version of *Diagraph* before June 30, 1987, we'll include a copy of Microsoft® Windows for only $49.

Computer Support Corporation
2215 Midway Road
Carrollton, Texas 75006
(214) 661-8960

All images shown were produced using Diagraph.

Suggested Retail:

Diagraph . . . . (Not copy-protected)	$395
Microsoft® Windows . . . (If purchased with *Diagraph*)	$49

Microsoft is a registered trademark of Microsoft Corporation.
Diagraph is a registered trademark licensed to Computer Support Corporation.

The new COMPAQ PORTABLE III™ represents the most power and performance ever to fit in a package this small. What makes it remarkable is that we sacrificed nothing to accomplish this feat.

It feels like we left something out. We didn't.

At 18 pounds, it features high-speed 12-MHz 80286 technology to run industry-standard programs up to 50% faster than 8-MHz 80286-based PC's without sacrificing compatibility. We offer 640 Kbytes of RAM standard, expandable to 6.6 Megabytes without touching one of its two optional full-size expansion slots. Plus the choice of an internal 20- or 40-Megabyte fixed disk drive to meet your mass storage demands.

What's ingenious is that you still get a full-size standard keyboard *with* a numeric keypad. A high-resolution adjustable plasma monitor displaying text and graphics on one screen. An optional internal modem. An industry-standard 5¼-inch diskette drive. Shock mounts for ruggedness and reliability. And more features that other companies, in order to get their portables more portable, left *out*.

Less weight, less wait.

Beyond its fast 12-MHz 80286 microprocessor, we also included optional high-performance fixed disk drives. And even high-speed RAM. These

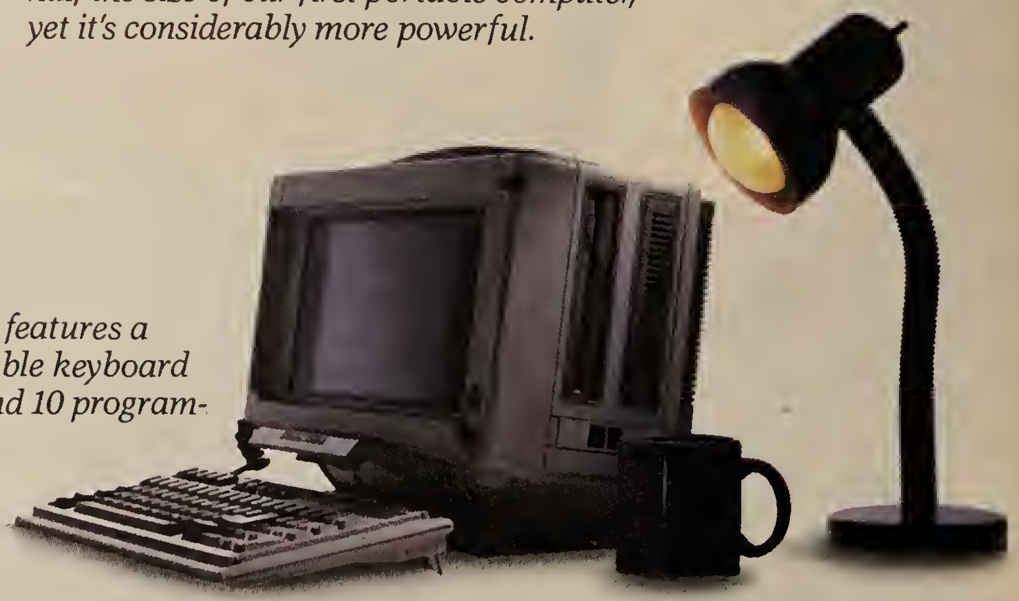
Introducing a new personal no other portable this small

Most other portables and laptops use slower microprocessors. Most don't offer high-resolution text and graphics or even a single expansion slot. Many don't offer high-capacity fixed disk drives. And not one offers shock mounting for the ruggedness you need.

Our new industry-standard 12-MHz 80286 microprocessor runs popular programs up to 50% faster than 8-MHz 80286-based PC's. Which is one reason the COMPAQ PORTABLE III delivers the highest performance of any portable computer.

The COMPAQ PORTABLE III is actually half the size of our first portable computer, yet it's considerably more powerful.

Our smallest portable yet features a standard full-size detachable keyboard with a numeric keypad and 10 programmable function keys.



performance enhancements work together to avoid bottlenecks and increase information flow. They also make the COMPAQ PORTABLE III the fastest portable computer in the world.

Once again, we've got a better handle on computing.

The COMPAQ PORTABLE III was built to survive the open road, but it can also hold its own on a desktop. It's the ideal executive workstation, allowing you to network, communicate with your mainframe, sort large data bases and run huge spreadsheets with ease.

The COMPAQ PORTABLE III is unique in that it combines these high-performance capabilities with a much smaller footprint. With the advanced capabilities you'd find in a high-performance desktop computer, the COMPAQ PORTABLE III is clearly the ultimate in portable computing today. This kind of innovative engineering is why Compaq is the world leader in portable computers.

See the new COMPAQ PORTABLE III on a desktop near you—at one of over 3000 Authorized COMPAQ Computer Dealers worldwide. *For more information* or the dealer nearest you, call 1-800-231-0900 and ask for Operator 32. In Canada, call 416-449-8741, Operator 32.

©1987 Compaq Computer Corporation.
All rights reserved.

computer that does something can do. Everything.

Our industry-standard 1.2-Megabyte 5¼-inch diskette drive means you're not forced to transfer your data to the 3½-inch diskettes most of our portable competitors use.

W*e feature high-performance 20- or 40-Megabyte internal fixed disk drives which give you plenty of storage and deliver an average access time of less than 30 milliseconds.*

It simply works better

COMPAQ
PORTABLE III™

NEW PRODUCTS

Systems

The Imageware Recognition System for data and text recognition has been announced by **Ibase Systems Corp.**

The system consists of the Palantir Software Compound Document Processor (CDP) 3000 XF and Ibase's Irecognize document processing software. It works with an IBM Personal Computer XT or AT.

Features include the ability to read documents at up to 100 char./sec., with an image resolution of 300 dot/in. Network interfaces for serial RS-232 ports and optional Ethernet connection are included. The software offers automatic forms processing, a verification editor and built-in communications for emulation of ASCII terminals and uploading data to hosts.

The Imageware Recognition System is priced at $39,500 for the Palantir CDP and $6,000 for the software.

Ibase, One S. Park Ave., San Francisco, Calif. 94107.

Software languages

Micro Focus Ltd. has introduced its **Micro Focus VS Cobol compiler**, said to support IBM VS Cobol on Microsoft Corp.'s Xenix.

The compiler is said to be capable of handling programs with code and data spaces of up-to-the-system-limits per compiled module.

It contains a preprocessor facility to ease the migration of Ryan-McFarland Corp.'s RM/Cobol-to-Micro Focus Cobol, the vendor said.

Features include 32-bit addressing, the ability to generate native code directly executable by the Intel Corp. 80286 and support for Cobol dialect such as IBM OS/VS Cobol and Micro Focus Level II Cobol.

The Micro Focus VS Cobol Compiler is priced at $1,495.

Micro Focus, Suite 400, 2465 E. Bayshore Road, Palo Alto, Calif. 94303.

Development tools

Iskra VME Technologies, Inc. has announced the **VME DOS** and the **VME XNX** VME-bus-based systems development kits for the IBM PC-DOS and Microsoft Corp. Xenix operating systems, respectively.

The VME DOS kit is said to allow users to run PC-DOS as a stand-alone operating system. Using the VME XNX starter kit, PC-DOS can reside as a hard-disk partition under Xenix System V, so the user can run either operating system. PC-DOS and Xenix can also run in parallel, sharing the same peripherals, in a dual-processor configuration. The VME XNX kit is an enhanced implementation of Xenix System V, Release 2.

The VME DOS costs $3,175. The VME XNX kit costs $3,495.

Iskra VME Technologies, 222 Sherwood Ave., Farmingdale, N.Y. 11735.

Software enhancements

Computerline, Inc. has announced **Plantrac Mark 4B**, an enhanced version of its project-planning system for Microsoft Corp. MS-DOS- and IBM PC-DOS-based computers.

Plantrac Mark 4B enhancements include multiple calendars and additional options for reporting progress and splitting resources.

Plantrac Mark 4B costs $3,000.

Computerline, P.O. Box 308, Pembroke, Mass. 02359.

Data storage

Manzana Microsystems, Inc. has announced a 1.44M-byte, 3½-in. **floppy disk drive system.**

The 1.44M-byte system comes as an internal drive, a host-powered external drive and a self-powered external drive. The internal system costs $325, the external host-powered unit costs $475 and the self-powered external unit costs $595.

Manzana, Suite B, 7334 Hollister Ave., Goleta, Calif. 93117.

INTRODUCING COMTROL'S
SMART HOSTESS™
A BREAKTHROUGH IN SYSTEM PERFORMANCE.

98 TIMES LESS CPU TIME REQUIRED FOR 7 USERS!
Transmitting at 9600 baud using XENIX, SMART HOSTESS requires 1% CPU time while an unintelligent multiport board requires 98% CPU time.

MORE USERS, MORE THROUGHPUT, MORE PROCESSING POWER.

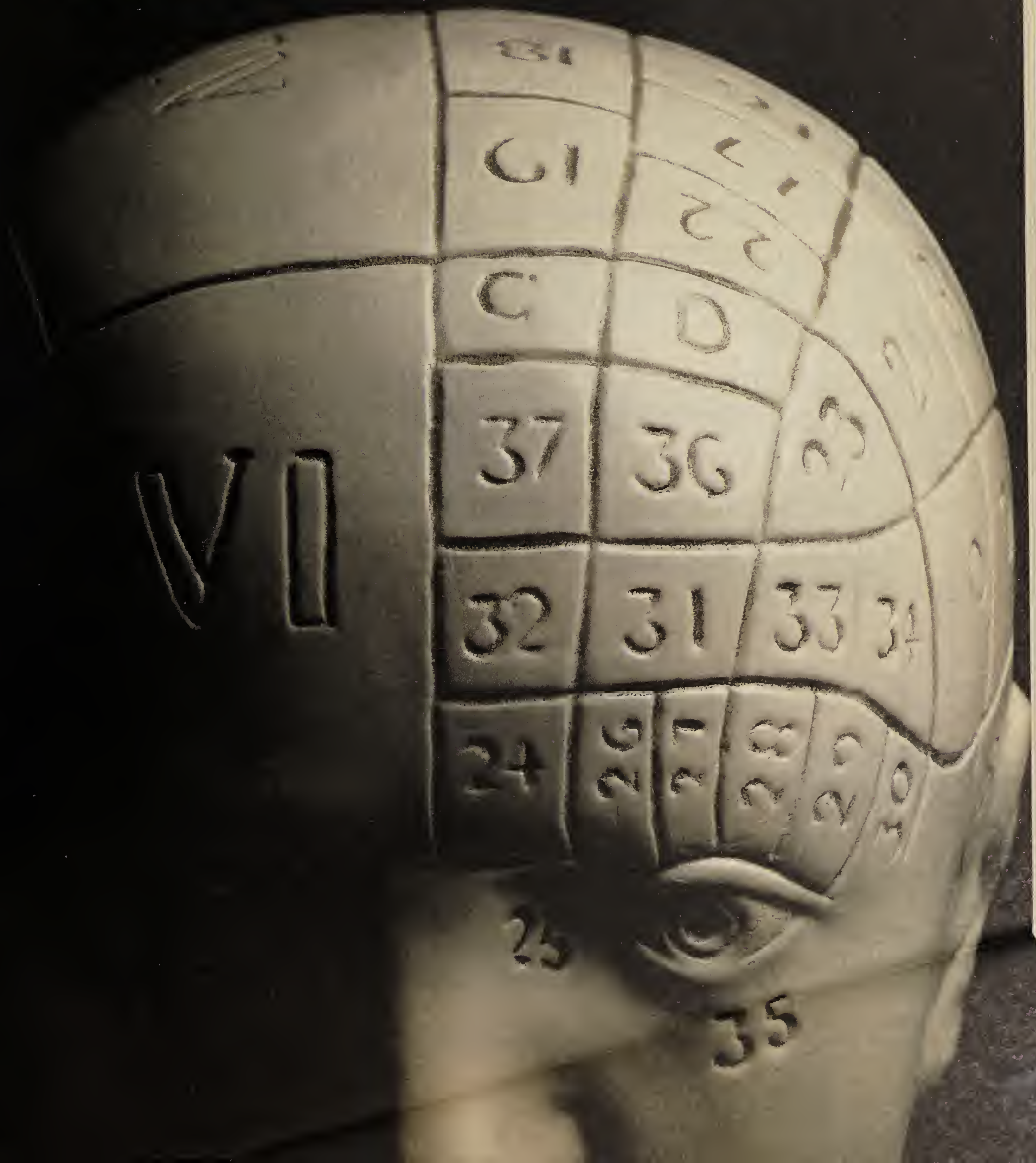
- 80186 on board frees CPU of routine I/O processing
- Add 4 or 8 serial ports per slot in a PC, XT, AT, or 386-based machine
- DMA, LOCAL BUS, & 16 BIT MEMORY transfers for faster data handling
- 256K dual-ported I/O buffer
  256K local memory
  128K program storage
- Our new TRANSPARENT PRINT feature connects printers to terminals without wasting serial ports
- Synchronous & asynchronous serial communication
- HOSTESS is the first name in multiport communications Quality since 1982

Comtrol
A Division of Control Systems
2675 Patton Road P.O. Box 64750
St. Paul, MN 55164
1-800-826-4281 • 612-631-7800

Call toll free for a benchmark testing report.
XENIX and DOS results are included in report.

SMART HOSTESS is a trademark of Control Systems, Inc. XENIX is a registered trademark of Microsoft Corp.

THE INTELLIGENT PERSON'S GUIDE TO NETWORKING.



THE 3SYSTEM. ALL YOU'LL EVER NEED TO KNOW.

Buying a network can be a headache.

With problems like complicated installation and usage, incompatibility and lack of connectivity.

Leaving you with the feeling that it really shouldn't be that difficult.

We couldn't agree more.

That's why we created the 3Com 3System.

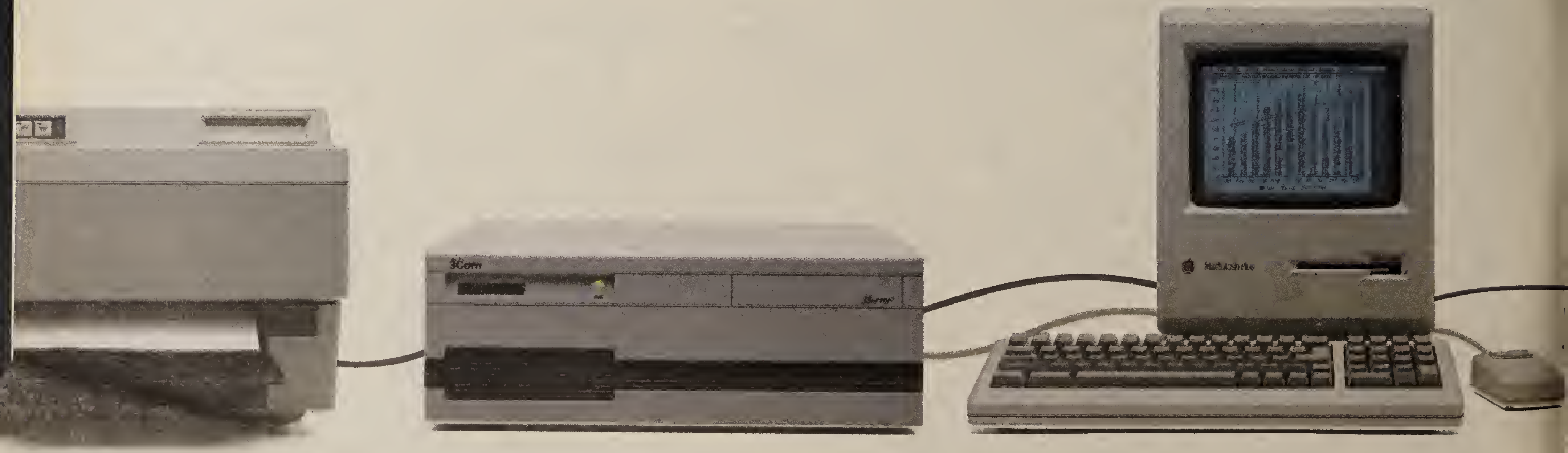
A total system solution designed and produced by a single company to optimize network productivity.

The 3Com 3System is as easy to install and manage as it is to learn and use.

You can link network to network, even when they are miles apart or running on different industry standards. You can also link micro to mini to mainframe with products like DCA's IRMALAN.

That's because the 3System is an "open system."

Which means it can work equally well with both IBM PCs and Macintoshes.



Copyright 3Com Corporation 1987. 3Com and 3+ are registered trademarks and 3Server3, 3System, 3Station and Workgroup Systems are trademarks of 3Com Corporation; IBM and IBM PC are registered trademarks of International Business Machines Corporation; Macintosh is a trademark licensed to Apple Computer, Inc.; IRMALAN is a trademark of Digital Communications

How is a 3System created?

Easy.

Run our 3+ operating software on our 3Server3 dedicated network server, incorporate your existing investment in PCs, printers, etc., via 3Com network adapter cards and connectors. That's the 3System.

And now you can even incorporate our new 3Station. The netstation created to optimize 3System.

What applications can you run on the 3System?

Just about anything your business could possibly need. Like Database, Publishing, Decision Support, Communications and Accounting.

We've worked with the developers of today's most popular multi-user software, like Ashton-Tate, Microsoft, Lotus, Aldus, Software Publishing and others to certify their products for optimum performance on your 3System.

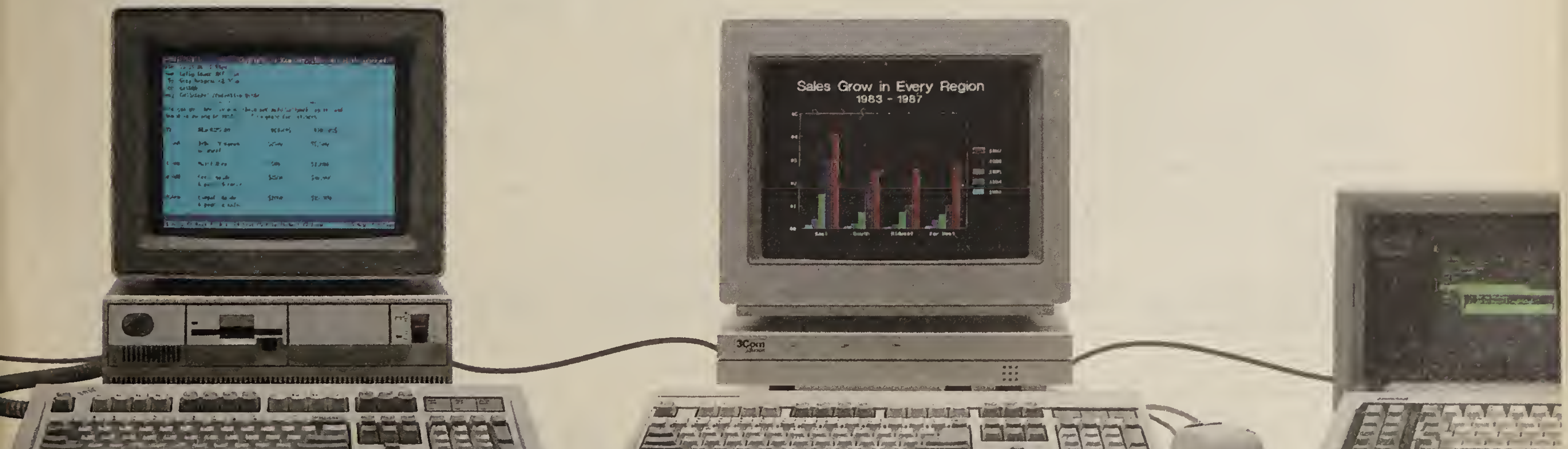
And because the 3System will be configured and installed by authorized 3Com dealers, it will have the after sales service and training you would expect.

Plus the 3Com guarantee of complete satisfaction.

As everything from 3Com always has.

For your nearest 3Com dealer,
call 1-800-NET-3Com.

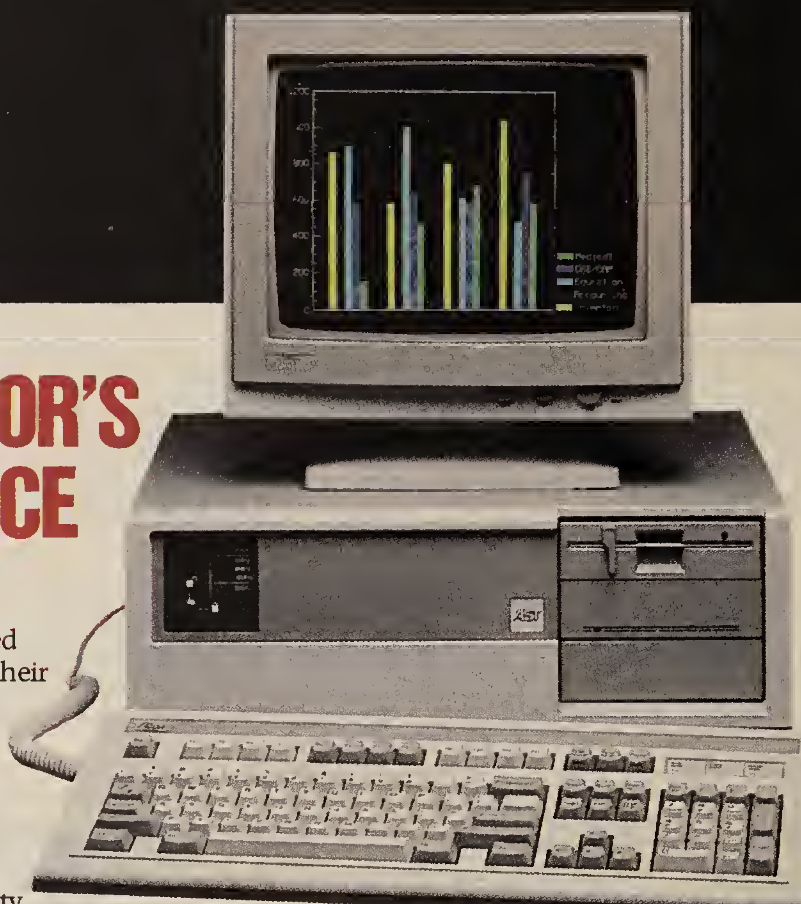
3Com®
WORKGROUP SYSTEMS



Associates, Inc.; Ashton-Tate is a registered trademark of Ashton-Tate; Microsoft is a registered trademark of Microsoft Corporation; Lotus is a registered trademark of Lotus Development Corporation; Aldus is a registered trademark of Aldus Corporation; Software Publishing is a registered trademark of Software Publishing Corporation.

"The AST® Premium/286™ Rates As What May Be The Best Designed And Built AT® Compatible On The Market Today."

–PC Magazine, April 28, 1987



PC MAGAZINE EDITOR'S CHOICE

Recently, PC Magazine awarded the AST Premium/286™ with their Editor's Choice Award for its "winning price/performance combination."

We weren't surprised.

When we designed the Premium/286, we built in uncompromising compatibility, speed and power. But, that's not all. We also built in a commitment to quality. The same quality that has been the trademark of our complete line of exceptional enhancement and communications products.

And, even though we weren't surprised at PC Magazine's award, we do consider it an honor. After all, the AST Premium/286 had only been in volume shipment for three months.

So, when it comes time for you to make a decision about buying a personal computer, you might want to remember what PC Magazine had to say about the Premium/286.

"The Premium/286 is without a doubt the best-looking and best-performing system with a 10-MHz rating. Its quality makes its price a bargain."

"The most elegant variation on the basic AT chassis…the machine should complement any office, including the CEO's."

"Workmanship is clearly top-notch."

"The AST Premium/286 uses a unique memory configuration to gain top honors in RAM access time."

"Overall, the AST Premium/286 rates as what may be the best-designed and built AT compatible on the market today. Others may come only faster, not better."

For more information, call **(714) 863-0181,** or send in the coupon to AST Research, Inc.

AST markets products worldwide that bridge the gap between the major computer vendors. With a wide range of enhancement and communications products for IBM,® Apple® and DEC™ computers, AST is the leader in multicomputer connectivity. AST—putting all of the pieces together.

In Europe, call 44 1 568 4350; in the Far East, call 852 0499 9113; in Canada, call 416 826 7514.

AST and the AST logo are registered trademarks and AST Premium/286 is a trademark of AST Research, Inc. IBM and AT are registered trademarks and PS/2 and OS/2 are trademarks of International Business Machines Corp. Apple is a registered trademark of Apple Computer, Inc. DEC is a trademark of Digital Equipment Corporation. Compaq is a registered trademark and Deskpro 286 is a trademark of Compaq Computer Corp. MS-DOS is a registered trademark of MicroSoft Corp. Copyright © 1987, AST Research. All rights reserved

Prices start at $1995. (Model 80)

	AST Premium/286 Model 140	**IBM® PS/2™ Model 60**	**Compaq® Deskpro 286™ Model 40**
Microprocessor	80286	80286	80286
Clock speed/ Wait States	10 MHz/0	10 MHz/1	12 MHz/1
Potential Throughput	2½ times the IBM PC AT	2 times the IBM PC AT	2½ times the IBM PC AT
Standard Memory Memory Expansion	1 MB 16 MB	1 MB 15 MB	640 KB 8.2 MB
Fixed Disk Drive	40 MB	40 MB	40 MB
Diskette Drive	5.25 inch (360 KB, 1.2 MB)	3.5 inch (1.44 MB)	5.25 inch (360 KB, 1.2 MB)
Expansion Slots	7	7	7
Operating System	MS-DOS*	PC-DOS	MS-DOS
Future Operating System	MS-OS/2*	OS/2™*	?
List Price	$3,495	$5,295[1]	$4,999[2]

*When available

[1] Price does not include DOS

[2] Price does not include DOS, Video adapter

Prices and configurations subject to change. Competitive prices as quoted per respective published product information 4/22/87; not compiled by PC Magazine. AST also offers Models 80, 90, 120 and 170.

Examine the specifications. PC Magazine compared the AST Premium/286 against ten AT-compatible computers. But, even when it's compared against the IBM PS/2 and the Compaq 286, the AST Premium/286 is the Price/Performance winner.

For more information on the PC that PC Magazine said was the best, send this coupon to AST today.

Name______________________________

Title______________________________

Company______________________________

Address______________________________

City_______________State_______Zip_______

Telephone______________________________

Send to: AST Research, Inc., 2121 Alton Avenue, Irvine, CA
92714-4992, Attn: M.C.
CW 6/1/87

You Guessed It. AST

COMPUTERWORLD

Now in our 20th year!

Reporting the future since 1967...

Join the celebration and save!

JUST 69¢ AN ISSUE

PLUS 12 BONUS ISSUES

PLUS FREE MAGIC MUG

Fill out and mail in the attached postage-paid envelope.

YES! I want to take advantage of this celebration offer. . .a full year of COMPUTERWORLD and the COMPUTERWORLD FOCUS issues for just $35, a savings of $9 off the basic rate. Plus, I'll receive my FREE Magic Mug with my paid subscription.

☐ Payment enclosed ☐ Bill me
☐ Charge my credit card ☐ AmEx ☐ VISA ☐ Mastercard

Signature ______ Card Expires ______

FIRST NAME M.I. LAST NAME
TITLE
COMPANY
ADDRESS
CITY STATE ZIP

Address shown: ☐ Home ☐ Office

☐ I'm already a subscriber, but I'd like to extend my subscription at this special low rate. (Attach mailing label above.)

Canada, Central & South America $110/ Europe $165/ All other countries $245 (Airmail).
Foreign orders must be prepaid in U.S. dollars.

Please complete the information to the right to qualify for the special introductory rate.

Basic Rate: $44

COMPUTERWORLD

Detach here, place in envelope, and seal securely.

Please indicate your business, function, and computer involvement below.

1 BUSINESS/INDUSTRY (Circle one)
- 10. Manufacturer (other than computer)
- 20. Finance/Insurance/Real Estate
- 30. Medicine/Law/Education
- 40. Wholesale/Retail/Trade
- 50. Business Service (except DP)
- 60. Government--State/Federal/Local
- 65. Public Utility/Communications Systems/Transportation
- 70. Mining/Construction/Petroleum/Refining/Agriculture
- 80. Manufacturer of Computers, Computer-Related Systems or Peripherals
- 85. Computer Service Bureau/Software/Planning/Consulting
- 90. Computer/Peripheral Dealer/Distributor/Retailer
- 75. User: Other ______
- 95. Vendor: Other ______ (Please specify)

2 TITLE/FUNCTION (Circle one)

IS/MIS/DP MGT
- 19. Vice President, Asst. VP
- 21. Dir., Mgr., Suprv.. IS/MIS/DP Services
- 22. Dir., Mgr., Suprv.. of Operations, Planning, Adm. Services
- 23. Dir., Mgr., Suprv., Analyst, of Systems
- 31. Dir., Mgr., Suprv., of Programming
- 32. Programmer, Methods Analyst
- 35. Dir., Mgr., Suprv.. OA/WP
- 38. Data Comm. Network/Systems Mgt

OTHER COMPANY MANAGEMENT
- 11. President, Owner/Partner, General Mgr.
- 12. Vice President/Asst. VP
- 13. Treasurer, Controller, Financial Officer

ENGINEERING
- 41. Engineering, Scientific, R & D, Tech. Mgt.

SALES
- 51. Manufacturing Sales Reps., Sales/Mktg. Mgt.

OTHER PROFESSIONALS
- 60. Consulting Mgt.
- 70. Medical, Legal, Accounting Mgt.
- 80. Educators, Journalist, Librarians, Students
- 90. Others ______ (Please specify)

3 COMPUTER INVOLVEMENT (Circle all that apply)

Types of equipment with which you are personally involved either as a user, vendor, or consultant.
- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems
- F. No Computer Involvement

332OB8722

NETWORKING

DATA STREAM

Elisabeth Horwitt

Too little, too late?

With AT&T's price cuts nipping at their heels, both U.S. Sprint Communications Co. and MCI Communications Corp. have been downplaying their roles as low-cost providers and talking up their enhanced services and the high quality of their lines. They are looking beyond the residential market, in which low prices make the biggest difference, and gearing up to go after the large corporate accounts.

The high-end interexchange arena could certainly use some competition. Business users are frustrated by having to pay whatever AT&T charges for such business-oriented services as Dataphone Digital Service (DDS) and Customer Controlled Reconfiguration (CCR). While wishing MCI and Sprint well in their struggles to put together the full-service package that large corporate accounts demand, it's hard not to wonder whether they have waited too long to effectively overtake AT&T.

An information network di-

Continued on page 59

Taking LU6.2 one step further

Early user widens peer-to-peer link into distributed processing system

BY ELISABETH HORWITT
CW STAFF

An early LU6.2 implementor, Savings Banks Trust Co., is ready to expand its peer-to-peer link between Digital Equipment Corp. and IBM hosts into a distributed processing system that also includes IBM Personal Computers.

Before this can happen, however, the New York-based financial service company needs two networking components: a file-transfer program that will run across all three hardware families' LU6.2 interfaces and peer-to-peer LU6.2 connections between DEC VAXs and computers other than IBM hosts.

In December 1985, Savings Banks Trust implemented LU6.2 links as the most efficient way for customers to access information and services residing on its VAXs and IBM 4300 mainframes running CICS. "It's absolutely, extremely reliable," said Kevin Kelly, senior vice-president for operations and systems management at Savings Banks Trust.

The $3 billion company is owned by a group of New York savings banks to which it provides information processing and data base maintenance services. Without the VAX-to-4300 link, the company would be severely constrained in its ability to provide customers with efficient online access as its business grows, Kelly said. For example, cash management systems are on VAXs, while branch processing applications such as check processing and demand deposit accounting are on the IBM hosts.

"There are so many applications on different computers; the reality is that we need a way to make the data bases one, or there will be tremendous response-time delay," Kelly said.

Now that multiple DEC and IBM hosts can exchange transaction data on a peer-to-peer basis, the customer can access multiple applications on multiple hosts through one terminal session, he explained.

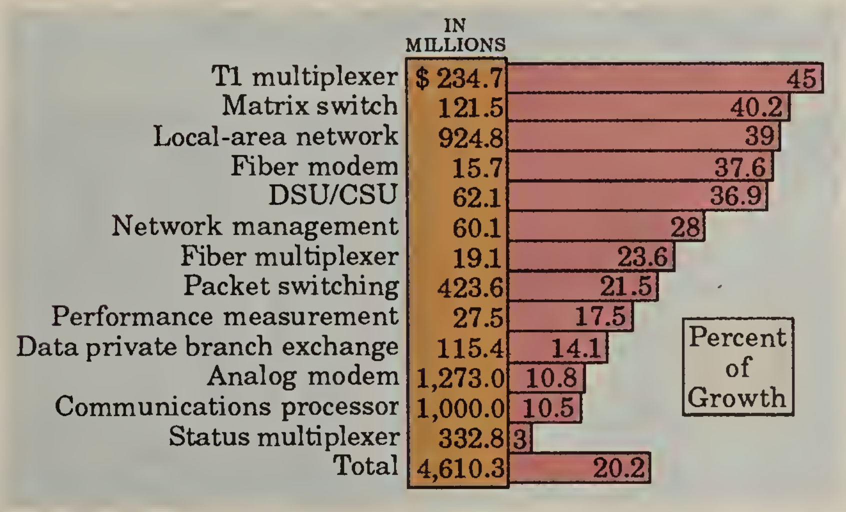
The bank service's "next logical step" is to make microcom-

Continued on page 60

Data View

Data communications equipment

Dollar-value shipments of U.S. suppliers, 1986-1987



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW CHART: SUSAN ALDAM

Users gain subrate

BY DONNA RAIMONDI
CW STAFF

NEW ORLEANS — The trend toward private network-user availability of subrate digital multiplexing got a boost from two products unveiled at the recent 40th annual International Communications Association meeting here.

Both Tellabs, Inc. and Case Communications, Inc. announced products featuring sub-

Continued on page 59

Quadstar for novice LAN users

BY PATRICIA KEEFE
CW STAFF

NORCROSS, Ga. — Quadram Corp. has entered the Starlan networking market with Quadstar, a complete product family targeted toward first-time users and said to feature ease of use and installation.

"Our goal is to take the fear out of networking," said Mark Butler, Quadram's senior product manager of communications products. He claimed the most computer-naive person can install and perform local-area network (LAN) tasks within a few hours. "We have removed the need for the communications guru," he added.

Quadram expects its approach to be of particular interest to small to medium-size businesses seeking to link four to five personal computers.

Quadstar adheres to the IEEE 802.3 1Base5 AT&T Starlan

Continued on page 58

Inside

- MAP continues to gain support with a steady flow of product offerings. Page 57.
- Intecom unveils an interface that allows computers to attach to its IBX. Page 58.
- AST Research announces a version of its communications board. Page 64.

MAINFRAME

```
printf("Hello, ^ world\n");
```

Meet the Industry's New Standard for Mainframe C Compilers

SAS Institute Inc. announces a mainframe version of the Lattice® C compiler—your key to truly portable applications.

With our compiler, you can develop C programs on IBM 370 machines, interface easily with non-C programs and software packages, and protect your programming investment across operating environments. Virtually every new computer supports C, and portable programs created with the mainframe compiler under OS or CMS will run on any other machine with a C compiler.

The mainframe compiler uses standard IBM linkage conventions. Assembler programs, MAIN routines in other high-level languages, and packages such as IBM's ISPF and GDDM can be invoked directly from C. And you can use C, instead of assembler, to develop small and fast subroutines called from other languages.

We designed the compiler listing and cross-reference to make programs easy to follow and errors easy to find. An extensive library offers functions from Kernighan and Ritchie and the Lattice PC C compiler. The run-time library produces explicit numbered error messages and a traceback of active function calls if an error occurs.

For all the facts—including details on economical annual licensing complete with free technical support and enhancements—call your Software Sales Representative today.

SAS is a registered trademark of SAS Institute Inc
Lattice is a registered trademark of Lattice, Inc.

Copyright © 1986 by SAS Institute Inc Printed in the USA

SAS®

SAS Institute Inc.
Box 8000 ☐ SAS Circle
Cary, NC 27511-8000
Phone (919) 467-8000
Fax (919) 469-3737

Digital has it now.

"It's access – fuller, easier information access that's at the heart of our success in selling Digital's networked desk-top computing," states Tom Curry, vice president of Marketing at McDonnell Douglas Manufacturing and Engineering Systems Company. "Architectural engineers now realize that the isolated PC is not the answer."

In Mr. Curry's view, Digital's ability to network, plus compatibility from individual workstations to huge processors are ideal for the architectural community. "For any building project to progress smoothly, there has to be a coordinated effort. The group working on lighting, for example, needs to share information with those designing heating and ventilation. In the Digital environment, that's exactly what they do."

"With Digital's networked desk, McDonnell Douglas is giving architectural engineers a more productive way to build."

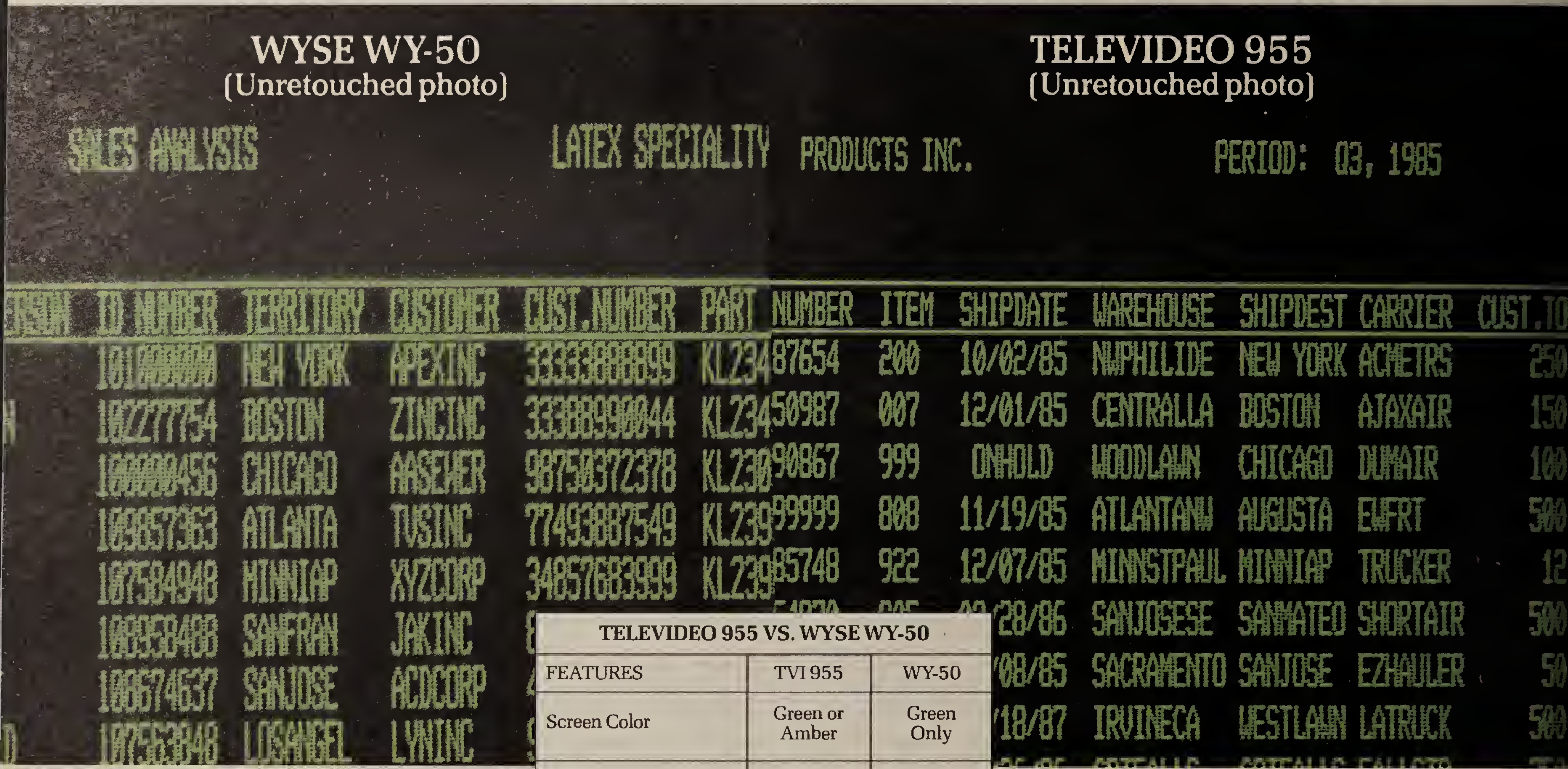
"In our own marketing efforts," adds Mr. Curry, "Digital offers two enormous competitive advantages. Planning for the future is easier because of Digital's commitment to compatibility. And we do very little selling of Digital to our customers – engineers are already sold." To get your competitive advantage now, write:

Digital Equipment Corporation, 200 Baker Avenue,
West Concord, Massachusetts 01742. Or call your
local Digital sales office.

digital™

© Digital Equipment Corporation 1987. The Digital logo is a trademark of Digital Equipment Corporation.

The TeleVideo 955. Seeing is believing.



```
SALES ANALYSIS               LATEX SPECIALITY PRODUCTS INC.              PERIOD: 03, 1985

RSON ID NUMBER TERRITORY CUSTOMER CUST.NUMBER PART NUMBER ITEM SHIPDATE WAREHOUSE SHIPDEST CARRIER CUST.TO
     101000000 NEW YORK  APEXINC  33333888899 KL23487654  200  10/02/85 NWPHILIDE  NEW YORK ACMETRS  250
     102277754 BOSTON    ZINCINC  33388990044 KL23450987  007  12/01/85 CENTRALLA  BOSTON   AJAXAIR  150
     100000456 CHICAGO   AASEWER  98750372378 KL23090867  999   ONHOLD  WOODLAWN   CHICAGO  DUMAIR   100
     109857363 ATLANTA   TVSINC   77493887549 KL23999999  808  11/19/85 ATLANTANW  AUGUSTA  EWFRT    500
     107584948 MINNIAP   XYZCORP  34857683999 KL23985748  922  12/07/85 MINNSTPAUL MINNIAP  TRUCKER   12
     108958488 SANFRAN   JAKINC                               28/86 SANJOSESE  SANMATEO SHORTAIR 500
     108674637 SANJOSE   ACDCORP                              08/85 SACRAMENTO SANJOSE  EZHAULER  50
     107563848 LOSANGEL  LYNINC                               18/87 IRVINECA   WESTLAWN LATRUCK  500
```

TELEVIDEO 955 VS. WYSE WY-50

FEATURES	TVI 955	WY-50
Screen Color	Green or Amber	Green Only
Optional Graphics model	Yes	No
Dynamically allocated non-volatile function key memory	512	128
Maximum non-volatile bytes per function key	256	4
High contrast super dark Matsushita screen	Yes	No
List price	$549	$499

Sure, most $600 terminals can scrunch 132 columns onto a 14″ screen. But you need a magnifying glass to read them.

Not so with the TeleVideo® 955. That's because we redesigned the proportion of our characters and put more space between them. And then put them on a high contrast, super dark screen. The result is the most readable 132 column ASCII display available.

But there's more to the 955 than meets the eye.

Take our tilt-and-swivel positioning, for example. The screen rotates through a full 270° right and left, and from −5° to +15° up and down. (Which makes backs and necks feel a lot better.)

Then we put all this in a machine with an incredibly small footprint, measuring just 9″ x 12.″ The result is a terminal that meets all the human factors standards recommended for adoption by the American National Standards Institute.

For more information about the TeleVideo 955, call the nearest TeleVideo regional office listed below, and we'll give you the name of your nearest distributor.

The TeleVideo 955. It's a real eye-opener.

TeleVideo®
Settle for more.

TeleVideo Systems, Inc., 1170 Morse Avenue, Sunnyvale, CA 94088-3568, (408) 745-7760, Regional Offices: Northwest (408) 745-7760, Southwest (714) 476-0244, South Central (214) 550-1060, Southeast (404) 447-1231, Midwest (312) 397-5400, East (516) 496-4777, Northeast (617) 890-3282. Amsterdam: 31.2503.35444, Paris: 33.1.4687.34.40, London: 44.9905.6464.

© 1987 TeleVideo Systems, Inc. WYSE is a trademark of Wyse Technology.

MAP products sprouting amid controversy

BY PATRICIA KEEFE
CW STAFF

Despite recent controversy and debate concerning the benefits and development thus far of the Manufacturing Automation Protocol (MAP), support for MAP continues to build with a steady stream of product offerings.

Oracle Corp. of Belmont, Calif., said its strategy for serving the computer-integrated manufacturing (CIM) marketplace calls for full integration of its SQL Star, a distributed data base management system with MAP software and hardware being used as the backbone for CIM networks.

The first step toward that goal is a partnership under way with Industrial Networking, Inc. in Santa Clara, Calif., a supplier of MAP-compatible factory networks. The two vendors are developing an interface under which SQL Star will function with MAP and interfaces provided by Industrial Networking.

> "CURRENTLY, for terminals on the factory floor, there is no MAP standard."
>
> DAVIS FIELDS
> INDUSTRIAL NETWORKING, INC.

Both companies have agreed to collaborate on the development of an interface between SQL Star and Industrial Networking's MAP/One products and to cooperatively market their products to large manufacturers. Each vendor reportedly will license its own products.

A third-quarter release is targeted for interface products that will allow dissimilar computers running Oracle software to communicate across MAP networks. Initial products should allow networking of Digital Equipment Corp.'s VAX and IBM Personal Computers on MAP networks.

Also incorporating Industrial Networking products, Simpact Associates, Inc. in San Diego recently introduced the newest member of its family of MAP-DEC interfaces, the MAP6420 subsystem.

The integrated product reportedly provides a high-performance cost-effective interface to MAP 2.1 broadband networks for DEC's family of VAXBI computers. The subsystem imposes minimum loading on a VAX host while allowing large blocks of data to be transmitted to and from the host at high data rates.

The subsystem hardware includes Simpact's VAXBI communications processor, a MAP/One-compatible token-bus controller and radio frequency modem and a distribution-panel kit. The basic subsystem software provides a low-level Common Application Services Element interface at the application layer. The basic package of software includes a host-resident operating system driver, a high-speed message-delivery protocol for the communications processor and a diagnostic test program. Also included is a right-to-copy license for the seven-layer MAP software.

The basic MAP6420 subassembly costs $12,000. Delivery takes 60 days.

A small handful of products were announced at the MAP/TOP Users Group meeting held here recently.

Among the new MAP offerings were an interface unit from Intel Corp. for IBM 370 computers and new products from Industrial Networking, including an RS-232 serial-interface unit using proprietary software.

The Intel Fastpath 9750M has a starting price of $98,100 and a late-summer release date. It reportedly provides an IBM mainframe with a direct connection to a MAP network. The Fastpath interface reportedly eliminates the need for a front-end communications controller, such as the IBM 3725, and an IBM Series/1 running MAP software, both of which are needed for an IBM mainframe to communicate on a MAP network.

"Fastpath attaches directly to a 370 channel, taking what three boxes do and combining it into one," a spokesman said.

The unit includes Intel-designed software, including a Common Application Services Element interface that provides a library of routines for users to write applications to the specification.

A second software component called the Virtual Telecommunications Access Method Logic Unit Pass Through allows users on the IBM mainframe to log on to VTAM applications residing on another 370 on the MAP network.

Industrial Networking rolled out an RS-232 serial interface unit that allows users to connect up to eight terminals or other RS-232 devices to a MAP network. The $3,950 MIU-20 is actually an enhanced version of Net/One NIU-180 from Ungermann-Bass, Inc. Industrial Networking is a joint venture of Ungermann-Bass and General Electric Co.

"Currently, for terminals on the factory floor, there is no MAP standard," said Davis Fields, an Industrial Networking product marketing manager. "Until that happens, we designed this thing to make that possible."

Fields said MIU-20 is based on MAP specifications for Layers I and II of the International Standards Organization's (ISO) Opens Systems Interconnect model, while Layers III through VII were designed by Industrial Networking.

The company also said it will offer carrier-band versions of its MAP interface unit products, as well a bridge product to link carrier-band to broadband networks.

Continued on page 60

DP RED BOOK DELIVERS...

40,000 DP users. Each DP Red Book lists 6,000-17,000 computer users covering the NY Metro Area (NY, NJ, & CT), Mid-Atlantic States (PA, VA, MD, DC, WV, & DE), New England Area (MA, ME, NH, RI, & VT), and NOW THE CHICAGO METRO AREA. Each site includes a profile of the hardware installed, software installed, (languages, databases, etc.), consultants used, future plans, applications, and DP executives' names, titles, and phone numbers. An index provides quick access to 136 cross references by hardware, software and industry. Price: NY-$700, MA-$395, NE-$395, and CHICAGO-$495. Call (212) 683-0606. Computer Management Research, Inc., 20 Waterside Plaza, NY, NY 10010.

CPF

The CICS Print Facility

CPF is the complete CICS based report distribution system.

Features include:

- Spools reports from CICS applications
- Message sending
- Allows secured user access to reports
- Automatic Aging
- PF key driven, with help screens
- Spools reports from JES or POWER
- Forms controls
- Displays reports on-line
- Screen copy for any CICS screen
- And More!

CPF allows sites to choose how they want reports distributed. Print batch reports on-line or print on-line reports in batch. Complete control of report distribution is accomplished at every level in your organization. Site specific install options allow sites to utilize the package for their own specific use. CPF is a full feature print spooling package that performs the work of up to ten other products.

CPF is available for OS and DOS sites and is compatible with all CICS environments.
Call today for a free trial or more information — (206) 842-1011

Software Technology, Inc.
12725-B Miller Road N.E.
Bainbridge Island, WA 98110

Don't get discouraged -there's ESP.

Scheduling can be simple, effective and efficient with ESP.

If the complexity and limitations of scheduling and processing control have discouraged you from considering an automated system, think ESP.

ESP
EXECUTION SCHEDULING PROCESSOR™

The only alternative.

For more information
contact Tina Rogers
Manager, Marketing and Sales
(416) 479-4611

Cybermation Inc.

Cybermation Inc
16 Esna Park Drive
Markham Ontario
L3R 5X1

Intecom introduces open application interface

Product increases PBX options, allows machines to run office automation programs

BY STANLEY GIBSON
CW STAFF

ALLEN, Texas — In an effort to increase the number of applications that can be run on its IBX private branch exchanges (PBX), Intecom, Inc. recently unveiled its Open Application Interface. The interface will allow a variety of computers to attach to the IBX and run office automation programs developed by users or third parties.

"It lets the external package do the application, not the IBX," said Janet Boling, Intecom's strategic planning manager. Users can run existing applications or write their own applications to control specific IBX functions, she said. The attached processor connects to the IBX over a 9.6K bit/sec. RS-232 connection.

Boling said the Open Application Interface is being used to develop programs for Wang Office from Wang Laboratories, Inc., although no such programs have been released yet.

But use of the program by non-Wang equipment vendors will also be encouraged by Intecom, which is a Wang subsidiary. At the International Communications Association show in New Orleans two weeks ago, Intecom demonstrated the package on an IBM Personal Computer working with an IBX.

Although Wang value-added resellers will get the interface specifications free of charge, developers specializing in other equipment will have to pay a nominal fee that has yet to be determined, Boling said.

The Open Application Interface is set to be an option with Version 7 of IBX software at prices ranging from $10,000 to $35,000. The programmer's guide for application developers will cost $500.

One prospective customer, who asked not to be named, greeted the new product enthusiastically, saying he plans to use the package with his IBX to install alert programs.

He said the facility could be used at his company to track currency-rate fluctuations. When an exchange rate reaches a critical point, the proper official could be notified automatically via a recorded message in order to respond.

Boling stressed that in executing the application's commands, the IBX would still give precedence to its own call-processing tasks so that a program would not overload the PBX. She said Intecom will offer classes in writing applications for the interface.

Quadstar

CONTINUED FROM PAGE 53

standard, has a data-transfer rate of 1M bit/sec. and uses twisted-pair wiring. The network is compatible with the IBM Personal Computer, PC XT, AT and compatibles, as well as IBM's Personal System/2 Model 30.

The network is upgradable and, via the addition of gateways and interconnects, can work with Ethernet and token-ring hardware, as well as other network operating systems, such as Novell, Inc.'s Advanced Netware or IBM's PC LAN Program.

Quadstar's intitial offering is via a prepackaged kit, Quadstarter, for first-time installations. The kit links two nodes and retails for $1,095. It includes QS-100, a high-performance half-card adapter; the QS-PH6, a personal hub-card adapter with six ports; 50 feet of cable; Torus Systems, Inc.'s icon-based Tapestry network operating system; Tapestry manuals; and an audio guide to networking.

Also introduced were the following three packages, all of which include a plug-in adapter, on-board direct-memory access controller and Tapestry workstation diskette and user guide:

- The QS-100, which features a high-performance half-card adapter and 8K bit/sec. on-board random-access memory (RAM), retails for $375.
- The QS-188 retails for $495 and features an intelligent full-size adapter, a personal hub card, 64K bit/sec. on-board RAM and 64K bit/sec. on-board read-only memory for IBM Netbios and Open Systems Interconnect software.
- The QS-PH6 combines hub and workstation functionality and retails for $575. It features an integrated, full-size adapter, personal hub card, 8K bit/sec. onboard RAM and one to five network ports for downward network connections. In addition, the Quadstar Hub-12 is a full-featured, 12-port stand-alone hub; it retails for $795. It features 800 feet between units, up to four hub levels, noise suppress and one port switchable for upward connection.

Quadstar is slated to ship June 15.

Prior to developing Quadstar, Quadram surveyed the market to determine users' views toward networking. The company found that users want standard-based networks that are simple to use, easy to install and expandable — either in number of nodes or in their ability to link into a backbone network. Users also do not want to have to learn new commands or languages, Butler said.

How to devise

Metier introduces ARTEMIS Project. An easier way for project managers to control just about everything.

Today, every manager is a project manager. Every manager watches over a budget, people and materials to accomplish a certain amount of work in a certain-to-be-not-enough amount of time.

ARTEMIS™ Project is the first PC software to give you both a sophisticated and a simple system for project management. To control changing costs, resources and deadlines. To devise new solutions to conquer the growing number of management problems.

New product development is one way ARTEMIS Project is used to monitor time and costs.

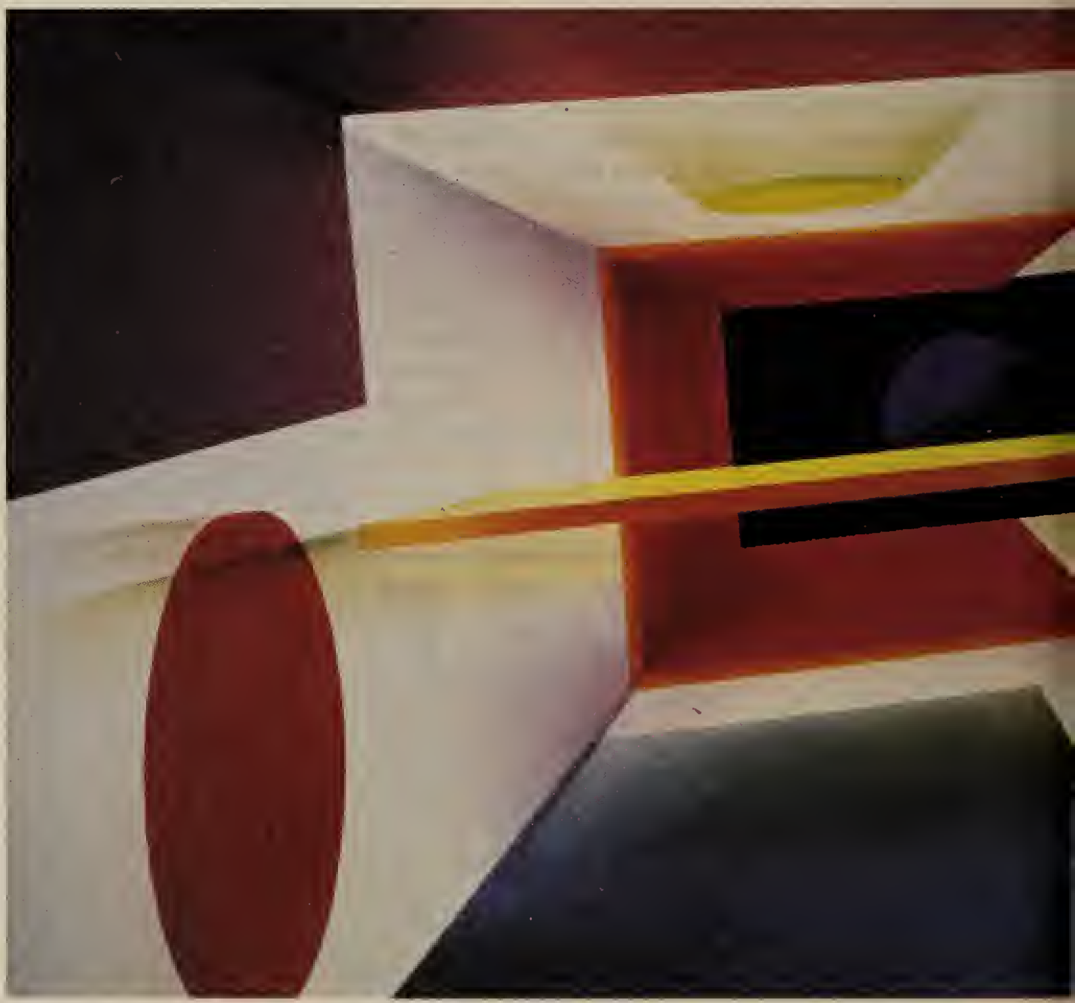
Project management explores new territory

ARTEMIS Project is designed by Metier, whose best-selling management systems are trusted to manage some of the world's largest projects. In aerospace, energy and construction. From building advanced aircraft to maintaining oil platforms in the North Sea.

Metier's success in traditional project management areas is now being discovered by new industries.

Financial institutions use ARTEMIS systems for software development. Manufacturers put it to work for assembly line changeover. And consumer products companies rely on ARTEMIS for research, development, marketing and sales.

Now that same proven problem-solving experience is available in software for IBM® and compatible PC's.



Nothing else compares

Compare ARTEMIS Project to more basic planning and scheduling software and you'll find all the standard features, improved.

For example, the calendars in ARTEMIS Project identify several work patterns including shift work, union rules and holidays for different countries. An interactive Calendar Editor then lets you compare those schedules to review workdays, make adjustments and defuse potential problems before they become real ones. Lesser systems just can't come close to this level of sophistication—or simplicity.

The interface makes it easy

Give ARTEMIS Project a screen test and you'll find the interface that's popular with users. Menus. Shortcut key operations. On-line, on-screen help that follows you along. Plus pull-down windows that build onto each other, tracing your steps and thinking ahead to your next move.

Watch networks develop

With the ARTEMIS Project interactive Network Editor, you can see your project network develop while you create it. Just like working with pencil and paper. The Network Editor gives you a more accurate and immediate view of

Too little

CONTINUED FROM PAGE 53

rector at a Fortune 500 company recently received offers from both companies to send their presidents to his office for a chat about why he should switch over from AT&T.

He declined, complaining that he has heard too much rhetoric and too little about real, available services from MCI and Sprint representatives — although he may yet decide to buy their services.

Joaquin Gonzalez, vice-president and director of the Gartner Group, Inc.'s Enterprise Network Strategies Department, feels that MCI and Sprint sat on their hands and raked in the profits while they still had their post-divestiture advantage of lower local-access charges over AT&T.

Instead, they should have introduced DDS- and CCR-like offerings and started a rates war with AT&T.

Vague answers

MCI and Sprint executives give vague answers to questions about when their companies will provide these crucial services.

Bill Burgess, vice-president of Sprint's International Division, says that the carrier now provides users with diagnostic data and reconfiguration with its Virtual Private Network service and will add to those services "as the market demands" and when Integrated Services Digital Network (ISDN) comes along. Fine; but businesses want their network management and DDS now, and who knows when ISDN will be here?

Some say Sprint may be relying too heavily on its Telenet Communications Corp. for data communications expertise. Telenet tends to think like the CCITT X.25 equipment and service company it is, while most business users think of T1 networking first and X.25 second — if at all.

MCI discontinued its own X.25 service in December 1986, but the company seems to be as cautious as Sprint about introducing enhanced T1-based data services.

"Our customers are unlikely to mix and match vendors in the data network, so it is a hard market to crack," says Jonathan Crane, vice-president of MCI's National Accounts Division.

MCI is using its own fiber-optic digital-networking facilities primarily to provide pipeline data services — high-speed pathways between nodes with high concentrations of traffic.

'You can hear a pin drop'

The two rivals continue to place great emphasis on the high-quality transmission provided by their fiber-optic networks — Sprint's "you can hear a pin drop" commercial is a classic example of this strategy.

But some business users remain skeptical about whether fiber will make all that much difference — especially since you rarely get fiber over that last mile to your premises.

And even if fiber does make a qualitative difference, savvy MIS strategists will still focus on the type of services to be delivered along that cable.

As another communications manager puts it: "You can't have a road without cars." Sprint and MCI, we'd like to see the latest models.

Horwitt is *Computerworld*'s senior editor, networking.

Subrate

CONTINUED FROM PAGE 53

rate digital multiplexing capability for sale to telephone companies and large user organizations. The subrate feature breaks T1 (1.54K bit/sec.) or DS-1 bandwidth into smaller (2.4K, 4.8K, 9.6K and 56K bit/sec.) increments.

Tellabs added the multiplexing to its 532 T-Carrier Cross-Connect System, while Case Communications introduced a networking T1 multiplexer with subrate capabilities.

Tellabs' subrate capability allows for the replacement of one T1 interface card in a customer's 532 TCS unit. The Case 7450 Digital Network Processor is fully compatible with AT&T's Digital Access and Cross-Connect System and allows users to integrate data, voice and video services into a single high-speed network.

Designating slices of bandwith

The advantage of these products over long-existing AT&T subrate digital multiplexing features is that corporations with private T1 facilities can designate bandwidth in slices less than DS0 (64K bit/sec.), or subrate, pieces, said Joaquin Gonzalez, vice-president of enterprise networking strategies at the Gartner Group, Inc. in Stamford, Conn.

"The telephone companies and AT&T have been doing this forever, but it was not available to customers," Gonzalez said.

Tellabs has been supplying such equipment to the telephone companies and is now trying to go after the end user, Gonzalez said. Meanwhile, Case, along with Avanti Communications Corp. and Network Equipment Technologies Co. — who announced similar products earlier this year — concentrate on the private market.

The effect of providing configurable bandwidth to end users could spur the telephone companies to allow more customer-controlled interaction with their networks, he added.

and conquer

your project, so you can input data, modify and move activities when things change, and make progress reports during the fact, not after.

Integrate more than schedules

ARTEMIS Project is the only PC software that lets you integrate cost and action items with the project schedule. So you can control just about everything related to your project. Costs, drawings, inventory, technical specifications, whatever, are easily linked to their activities by simply noting specific action items.

ARTEMIS Project grows with you

Expandability is another built-in advantage. ARTEMIS Project works as a stand-alone system or as part of a management network, using ARTEMIS Link to connect to ARTEMIS mini and mainframe systems. ARTEMIS Project also works with popular personal productivity software, adding value to your current software investment.

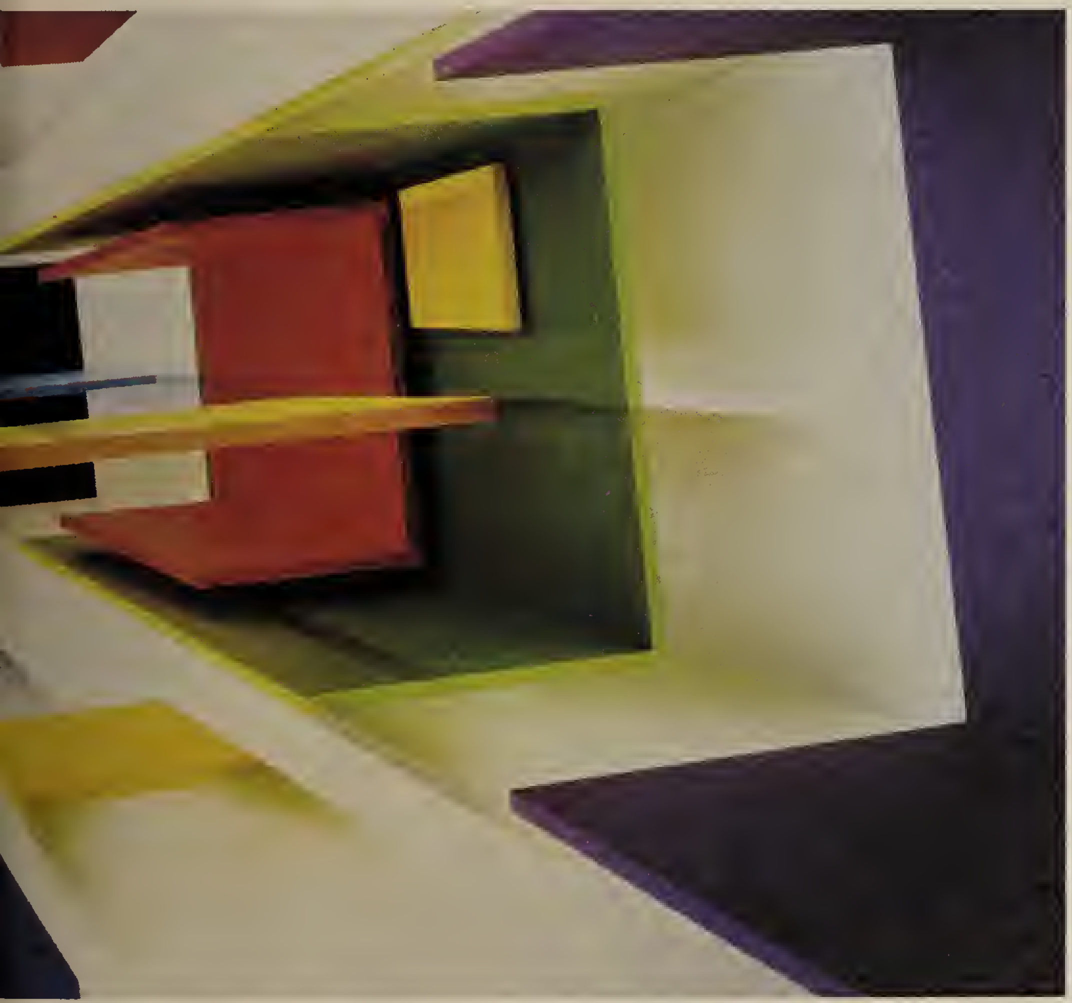
Take control

ARTEMIS Project gives more managers more ways to devise solutions and conquer problems. To take control of costs, resources and time.

Metier supports ARTEMIS systems from offices worldwide, with complete training, installation and service. Including Metier Professional Services, to provide complete system consultation. Artemis Learn, an optional on-line tutorial for instruction in both project management and ARTEMIS Project. And an ARTEMIS PC Hot Line, to answer all your questions.

Metier is a division of Lockheed, reflecting a continuing commitment to quality and innovation.

To order an ARTEMIS Project Preview Package or for information on ARTEMIS micro, mini and mainframe systems and software, call 1-800-999-9100, extension 50B. Or write Metier Management Systems, Department 50B, 2900 North Loop West, Houston, Texas 77092, USA. Telex: 774367 METIER HOU.



ARTEMIS Project brings mainframe power to the PC to control every dimension of your project, simply.

Financial institutions bank on ARTEMIS Project to develop software applications.

©1987 Metier Management Systems
IBM® is a registered trademark of International Business Machines Corporation.
ARTEMIS™ is a trademark of Metier Management Systems.

TAKE CONTROL WITH METIER Artemis™ Project

LU6.2

FROM PAGE 53

puters part of a distributed processing system in which computerized problem solving would happen on whatever size system best suited the application. Data could then be accessed transparently by the user, without the need to worry about the type of system on which it was stored.

"LU6.2 gives you the ability to avoid the old conventional way of data transfer, where you write a program to transfer data from computer A to computer B, then access it on computer B — a waste of code and disk space," Kelly said.

Savings Banks Trust is currently looking at XCOM, an LU6.2-based file-transfer program from Spectrum Concepts, Inc., a New York-based software and consulting firm that helped Savings Banks Trust implement its VAX-to-4300 LU6.2 link.

XCOM would, for example, allow the user to run an asset-liability analysis model on a micro while at the same time querying an IBM mainframe data base for the net worth of each bank in the state, Kelly said. "Instead of having to contact the mainframe first, you just zip into the file, ignoring the complexity of the mainframe. That's the power," he said.

The company already has been writing LU6.2-based PC-to-mainframe applications, but XCOM, by providing basic file-transfer functions on top of LU6.2 for the VAX, IBM CICS and PC systems, "brings applications down to the applications-programmer level, as opposed to the systems programmer level, which is 50% more expensive," Kelly explained.

Savings Banks Trust is still exploring XCOM as a possible solution. One problem still to be solved is a gap in DEC's LU6.2 product, which is used by the VAX version of XCOM. Right now, VAXs can communicate with IBM hosts, but not with any other type of computer, via a peer-to-peer LU6.2 connection.

A DEC spokesman recently told *Computerworld* that the firm sees Open Systems Interconnect, not LU6.2, as the solution for multivendor peer-to-peer communications. However, Savings Banks Trust, which resells DEC hardware to its customers, is "aware of the problem and will try to influence DEC," Kelly said.

Campbell Soup, Smith Barney, The Commonwealth of Virginia and USAir have all benefited from Peat Marwick's unequalled information systems development experience.

Maybe you can, too.

In an area where experience really counts, you can count on Peat Marwick. Our experienced systems consultants bring you the highest level of expertise, whether your project involves systems planning, custom design and development, packaged software implementation or software re-engineering services.

Peat Marwick's systems consultants average more than ten years' experience. What this means to you is an unequalled opportunity to get more out of the system you are planning, developing, implementing or maintaining. Our consultants provide high quality, and reliable consulting services that will help take the risk out of your critical systems projects. And they will follow through to insure that your systems continue to perform at peak effectiveness.

You can benefit from the information systems skills that have helped some of the world's finest corporations and governments. For more information and a free copy of our systems brochure, "Meeting the Technology Challenge," send in the coupon below or call **1-800-344-3600.** (In Illinois, call 800-328-4200.)

Mail to: Peat Marwick Main & Co.
345 Park Avenue, Box ISS, New York, NY 10154

Name
Title
Company
Address
City
State Zip

KPMG Peat Marwick
Accounting and Auditing/
Tax Services/Management Consulting/
Information Systems Services

MAP intros

FROM PAGE 57

Carrier-band versions range in price from $2,450 to $3,000. Users pay an additional $550 per carrier-band unit for the associated MAP software. The MBR-40 MAP Bridge costs $15,900.

Interface for ISO nets

Also at the show, Communications Machinery Corp. in Santa Barbara, Calif., introduced its R-series interface for ISO protocols. It gives Technical and Office Protocol (TOP) users applications with functionality equivalent to Transmission Control Protocol/Internet Protocol (TCP/IP) applications for their ISO networks.

The interface is similar to the University of California at Berkeley's Unix System 4.2 applications for TCP/IP networks and offers Unix RVT, RFT and REX functionality.

R-series applications communicate with the Class Four Transport Layer that resides on-board Communications Machinery's Ethernet Node Processors for DEC VMEbus and Multibus and IBM's PC AT interfaces for Unix and Microsoft Corp. Xenix and MS-DOS environments.

Communications Machinery "allows TOP users to invest in their hardware needs today with the ability to migrate to TOP 3.0 application software when these products mature," said Russell Sharer, the company's director of marketing.

The R-series as a part of TOP for DOS products costs $450, and includes a Netbios interface to TOP on-board the Ethernet Node Processor. Communications Machinery's TOP for Xenix costs $600, and TOP for Unix costs $1,500. All products are set to be available in July.

Senior writer Rosemary Hamilton contributed to this report.

I Need To Know About It!

●

CA-Universe
It's everything everyone
says a true
relational DBMS
should be.

●

( ) Please send me more information.
( ) Please arrange a free demonstration.

Name ______________ Title __________
Company ______________________________
Address ______________________________
City __________ State _____ Zip _______
IBM Mainframe Model __________________

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 216 ANDOVER, MA

Postage will be paid by addressee

COMPUTER
ASSOCIATES™

Computer Associates International, Inc.
One Tech Drive
Andover, MA 01810-9986
Attn: Chris Andrews, Marketing Communications

CW 6/1

Relational DBMS

What IBM® Has Created, Computer Associates Has Improved.

CA-UNIVERSE™, the complete, fully operational relational DBMS is here—with advantages important to you such as:

More powerful SQL
Stronger language and facilities—greatly improved while maintaining compatibility with the industry standard.

An active Data Dictionary
Multiplies your programmers' efficiency by maintaining all information relating to both the data base and applications development. Automatically updated to reflect all changes.

Referential Integrity
Central definition and automatic, efficient enforcement ensures business data integrity without requiring repetitive programming and maintenance efforts.

Data Independence
Our 3-schema architecture assures independence of the highest order greatly simplifying applications development.

Runs on VSE, VM, MVS
The data base and its applications are completely transparent to and independent from the operating system allowing them to run in any environment without modification.

VSAM Transparency
Facilitates migration and keeps things running without a hitch—or the need for program modifications.

Service and Support—the real thing
Included in the price are a full week's training on site, and assistance in developing your first application. Follow-up training, all you need, is available, too. That's the commitment of Computer Associates—the world's largest independent software company—bringing you the most comprehensive service and support in the industry!

We invite your comparison. We offer an excellent solution based upon the efficiency of our design, the capabilities of our user and programmer tools, and the strength of our service and support—and we'd like to prove it. Call or write today and ask us for a demonstration.

CA-UNIVERSE is a trademark of Computer Associates International, Inc. IBM is a registered trademark of International Business Machines Corporation.
© 1987 Computer Associates International, Inc.

1-800-343-4133
(In Massachusetts 1-800-322-0491)

COMPUTER ASSOCIATES
Software superior by design.™
One Tech Drive, Andover, MA 01810-2497

If you're no
ACCUNET P
what are you

Perhaps the people waiting in long lines at your reservations counters are starting to take their business someplace else.

Or the electronic mail you were expecting didn't arrive because your lines were overloaded.

Or, possibly, your preferred customers are becoming somewhat annoyed with the persistent delays of your electronic order-processing system.

The truth is, when it comes to packet services, your business can't afford anything less than the best: AT&T ACCUNET® Packet Service. A software-controlled, public-data network with superior performance.

But don't take our word for it.

Check the facts and compare our service with the one you're using.

You may find that your packet service just doesn't add up.

AT&T comes through with a high-performance packet service.

Speed: In this area, ACCUNET Packet Service excels in four critical ways. First, ACCUNET Packet Service provides the benefits of the X.25 protocol—including automatic error detection and correction—without compromising throughput or response time.

Second, because ACCUNET Packet Service has a high throughput of at least 95% of the throughput class rate, batch transfer applications can be carried out with extraordinary speed.

Third, calls can be set up very quickly (usually in only 1/2 a second or less) due to the high built-in capacity of our ACCUNET Packet Service Network.

And, last but not least, response time on ACCUNET Packet Service is unusually fast because of our complete switch interconnection. 128-octet packets are delayed only 1/5 of a second or less when using a throughput class of 9600 bps and a 56 Kbps access line.

Domestically, the high performance of our ACCUNET Packet Service makes it the right choice for a wide range of business applications.

But what really sets our ACCUNET Packet Service apart is that its speed and accuracy are not compromised for transmissions on a global scale.

Satellite time delays can be avoided because AT&T International ACCUNET® Packet Service uses completely terrestrial transmission media (except to Hong Kong).

And our International ACCUNET Packet Service transmits directly to overseas packet networks. Transmissions are faster because your data travel across only one internetwork gateway.

As always, with the X.25 protocol, AT&T International ACCUNET Packet Service data transmission is extremely accurate. AT&T International ACCUNET Packet Service is now available in Canada, Japan, the U.K., West Germany, France, Italy and eleven other countries (with more planned).

Dependability:

Automatic alternate routing and backup switches ensure that our ACCUNET Packet

© 1987 AT&T *Registered trademark of Control Data Corporation.

using our
acket Service,
waiting for?

Service Network will be working when you need it. What's more, our ACCUNET Packet Service Network Control Center monitors the network 24 hours a day, 7 days a week.

And you can count on ACCUNET Packet Service to give you a dependable connection. In fact, we've designed the network for a maximum blocking rate of less than one virtual call for every 1000 attempts—even during the busiest hours.

Accessibility:

Depending on the extent of your processing needs, ACCUNET Packet Service can be accessed in one of two ways. For high-volume locations, dedicated access lines are recommended.

For locations with lower volume data transmissions, however, it's more cost-effective to use REDI-ACCESS* With REDI-ACCESS, you can dial into our ACCUNET Packet Service Network from your terminal without dedicated lines, equipment, or an X.25 interface unit.

REDI-ACCESS, a joint offering of AT&T and Control Data Corporation, is available via 150 access points, with 150 more planned for this year.

Planning and Support:

With our expertise, we can help you get the most out of the speed, accuracy and dependability of ACCUNET Packet Service. Because we'll work with you to custom-design and implement an ACCUNET Packet Service solution that will help you streamline your business. And as your business grows and changes, we'll maintain and modify your system to make sure it's always operating at peak efficiency.

From equipment to networking, from computers to communications, AT&T comes through.

To find out more about ACCUNET Packet Service, and how it can save time for both you and your customers, talk with your account executive at AT&T. Or one of our sales representatives at 1 800 222-0400.

AT&T
The right choice.

NEW PRODUCTS

Local-area network hardware

The **AST Research, Inc. Camintonn/DEC Products Group** has announced the **CM-DHV11-C** dual-height card, a version of its CM-DHV11 communications board.

The card features eight full-duplex asynchronous direct-memory access Serial lines, one of which can be configured as a DL-type console line. This line provides a console port to a Digital Equipment Corp. Microvax II or Q-bus system. The board supports throughput of more than 45K bytes of char./sec. Full-modem support is available on all DHV lines, and users can choose either the RS-232C or RS-423A interface.

The CM-DHV11-C communications board is priced at $899.

AST Research, 2121 Alton Ave., Irvine, Calif. 92714.

Local-area network software

Intel Corp. has introduced **MAP development starter kits** for application development and testing on a broadband Manufacturing Automation Protocol (MAP) local-area network.

The basic kit includes two Intel ISBC 554 MAP communications boards, a head-end remodulator, MAP communications software, a cable starter kit and documentation.

The expanded kit includes two Intel System 310 Model 401 Multibus systems and Release 7.0 of the real-time operating system.

An optional node-expansion kit consists of an ISBC 554 MAP board, coaxial cable, a System 310 back panel I/O adapter and software.

The basic kit costs $27,500. The extended kit costs $64,990. The node-expansion kit costs $4,550.

Intel, W363, P.O. Box 58065, 3065 Bowers Ave., Santa Clara, Calif. 95052.

Customer-premise equipment

Voicetek Corp. has announced **VTK/Audiotex**, an application software package for its line of voice computers.

The menu-driven voice application development package can be configured through the use of keyboard commands. It allows for up to 64 user-defined functions. While one audiotex application is running, others can be created on the same system. The message or prompts can be put onto the system through a telephone, a local microphone or via prerecorded cassettes and then edited during system operation. Reports to track calling activity on the system are included.

VTK/Audiotex is available on the Voicetek VTK 60 and VTK 81 voice computers. Pricing, including voice computer, begins at $25,000.

Voicetek, 61 Chapel St., Newton, Mass. 02158.

Links

Tekelec has introduced its **Ethernet Bridge**, part of its Total Access Network Systems, said to allow network users with two or more Ethernet networks to join them together.

The bridge consists of two communications processors and software. One processor is located on each side of the networks to be connected. The synchronous links between the two units provides users with a choice of communications, such as one or two 64K bit/sec. links or four low-speed simultaneous links. In addition, a multiple-link protocol allows dynamic load balancing and alternate routing.

The Total Access Network Systems Ethernet Bridge is priced at $12,500.

Tekelec, 26540 Agoura Road, Calabasas, Calif. 91302.

Electronic mail

Britz Publishing, Inc. has announced the **Mailbox** elecronic mail system for the IBM System/34 and 36 family of computers.

Mailbox is said to allow users to send electronic messages to individuals, groups of individuals or all users on the system. A user can check to see if messages have been sent and then selectively review any messages that have been received.

Mailbox is priced at $99.

Britz Publishing, 1814 Capital Towers, Jackson, Miss. 39201.

Modems/Multiplexers

Practical Peripherals, Inc. has introduced a version of its Practical Modem 1200 SA called the **Practical Modem 1200 SA Mini**.

The compact modem is a stand-alone Hayes Microcomputer Products, Inc.-compatible unit said to retain all the features of the full-size modem. It offers 1,200 or 300 bit/sec. transfer rates and autodial and autoanswer capabilities. Other features include the ability to store up to 10 telephone numbers, menu-driven configuration and pulse or tone dialing. It plugs into the back of a terminal or computer through an RS-232C interface.

The Practical Modem 1200 SA Mini is priced at $199.

Practical Peripherals, 31245 La Baya Drive, Westlake Village, Calif. 91362.

The easy way to network terminals, minicomputers, and PCs.

Introducing an incredible data PABX breakthrough.

It's never been easier to get started in data switching. Because now you can rent data PABX equipment from MICOM, the world leader.

Now MICOM offers a no risk way to expand access to your computer system.

The INSTANET6000 Series 20 is a little data PABX with lots of capability, designed into a bookshelf sized enclosure. And you can rent it for as low as $6.50 per channel per month, depending on the configuration you choose.

And when it comes to features, the Series 20 is priceless. It's a flexible, easy way to interconnect up to 250 computer ports and users in a single step.

There are also easy-to-use menus to guide new users through the system. Plus, you won't need to run bulky lengths of cable between the Series 20 and individual devices, like terminals and printers. Our Data Distributor can be conveniently located near your equipment, using only two existing wire pairs. This makes for fast terminal connections and eliminates cumbersome RS-232 cable.

What's more, the Series 20's small size fits into your office as comfortably as its low price fits your budget.

To find out how easy it is to rent and install an INSTANET6000 Series 20 data PABX, call us at the MICOM applications hotline.

No one knows more about data PABX than MICOM. That's why our customers have already bought and installed over 1,000,000 channels. And now they can rent from us. And only us.

Because when it comes to renting data PABX, we own the market.

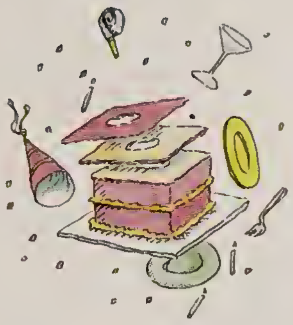
The channels are as low as $6.50 per month, but you can get your questions answered for free. Call the MICOM Hotline for more info or applications assistance.

DATACOMM BY MICOM

More ways to help computers do more.

MICOM Systems, Inc., 4100 Los Angeles Avenue,
Simi Valley, CA 93062-8100. Europe: UK-(44) (635) 832441.
Int'l: USA-(01) (805) 583-8600.
"MICOM" and "INSTANET6000"®

COMPUTERWORLD



20th ANNIVERSARY EDITION

The age of MIS

Say goodbye to the old MIS role model of cool, analytical Mr. Spock. The new MIS inhabits a less structured world—a world full of business challenges, a world where MIS is the innovator.

THE HUMAN ELEMENT IS NOW THE KEY TO UNLOCKING THE POTENTIAL OF CORPORATE SYSTEMS.

COMPUTERWORLD
INSIDE
Prime powers up to 3090 range
Multiuser support in OS/2 plan

MANTIS® vs. CSP

Before You Pass Judgement, Bring Both To Trial.

Considering CSP? Then consider this: with MANTIS from Cincom® you can prototype, develop and process better quality applications, faster, and more effectively than CSP from IBM®. And the higher quality MANTIS applications are far easier to maintain.

Fewer Development Steps Mean Faster, Easier Program Development.

MANTIS is more powerful than CSP, and it is much easier to learn and use. MANTIS gives faster start-to-finish development of applications. Its functionality also enables a much broader and more comprehensive range of usage. For example, studies show that 90% of all MANTIS users are using MANTIS for over 90% of all on-line development.

More Flexibility, Complete Portability.

MANTIS supports all the same environments as CSP, and provides complete portability to DEC™ VAX™ and MicroVAX™, WANG® VS, NCR® VRX, and certain Honeywell® systems.

Fast Processing Means Low Cost.

Its high speed processing facilities make MANTIS usable for almost all on-line requirements, thereby increasing programmer productivity while also cutting processing costs.

Why Not Learn More?
Call Today For An In-House Trial.

Don't make a final judgement until you have all the facts about MANTIS. Call today to set up an in-house trial. Or, write Marketing Services Department, Cincom World Headquarters, 2300 Montana Avenue, Cincinnati, Ohio 45211. Experience the ease, speed and power that MANTIS provides in solving **your** application development needs. You'll be glad you did.

1-800-543-3010
In Ohio, 513-661-6000.
In Canada, 1-800-387-5914.

CINCOM®

Advanced Systems And Applications Software For IBM And VAX

MANTIS is a registered trademark of Cincom Systems, Inc. IBM is a registered trademark of International Business Machines Corporation. DEC, VAX and MicroVAX are trademarks of Digital Equipment Corporation. NCR is a registered trademark of NCR Corporation. WANG is a registered trademark of WANG Laboratories, Inc. Honeywell is a registered trademark of Honeywell, Inc.

Inside

WHERE WERE YOU IN '67?

With some convincing, industry luminaries let us publish past and present photos. Page 20th/4

BACK TO THE FUTURE

From Pax Cyberneticus to the Golden Age, here's the story of MIS. Page 20th/8

THE NEW MIS

No rest for the weary. Today's managers juggle user needs, PCs, mainframes and the networks that connect them. Page 20th/14

PROFILE: BANKING ON DEC

Bankers Trust Co. Vice-President Stanley Rose. Page 20th/20

PROFILE: MANAGER FOR ALL SEASONS

Leland McGraw, Vice-President of Information Technology at Chevron. Page 20th/25

PROFILE: TAKING CARE OF BUSINESS

Cigna Corp. Senior Vice-President Allen Loren. Page 20th/30

SECTIONS

Flashbacks: Starts page 20th/9
Software timeline: Starts page 20th/15
Hardware timeline: Starts page 20th/31
The year 2000: Page 20th/22
Interview: A charter subscriber: Page 20th/24
CW's many faces: Page 20th/28

Senior Editor - Janet Fiderio
Assistant Editor - Kelly Shea
Design Editor - Marjorie Magowan
Design Consultant - Ronn Campisi

Cover Artists - Chris Demarest (top); Jamie Bennett (bottom)
Cover Photo - P. Charles Ladouceur; The Liberty Mutual Data Center, Portsmouth, N.H.

Copyright 1987 by IDG Communications. All rights reserved. Reproduction of material appearing in Computerworld's 20th Anniversary Edition is forbidden without written permission. Send all reprint requests to Nancy Shannon, CW Communications/Inc., Box 9171, 375 Cochitutate Road, Framingham, Mass. 01701-9171

WHAT TOMORROW HOLDS

It is a newspaper's duty to print the news and raise hell.
— Chicago Times, 1861.

How much does today's *Computerworld* hold in common with its very first issue, published 20 years ago this month? This is best answered with another question: What does this year's computing community share with the data processing shops of the past two decades?

In one sense, *Computerworld* has not changed at all — and that is in its dedication to provide computing professionals with essential information on events that reshape their environment.

BILL LABERIS

Since the turbulent days of the late '60s, the computer industry has grown faster and changed more rapidly than any other business in modern history. *Computerworld's* charter has been to stay one step ahead of this change. Thus, in another sense, *Computerworld,* like the industry it covers, has been in a constant state of flux.

In remaining true to its mission and charter, *Computerworld* has earned a nickname from our readers, one we're proud of — "the bible of the industry." Through the years, we have labored to provide information that professionals trust, information on which they have based significant strategic decisions.

We have never taken our responsibility more seriously than we do today, when our readers demand order from changes that are more frenetic than ever.

Bill Laberis

……

REMARKABLE 20 YEARS

No one knows *Computerworld* like its founder Patrick McGovern, chairman of International Data Group. He recently talked about CW's past, present and future.

Why did you begin *Computerworld?*

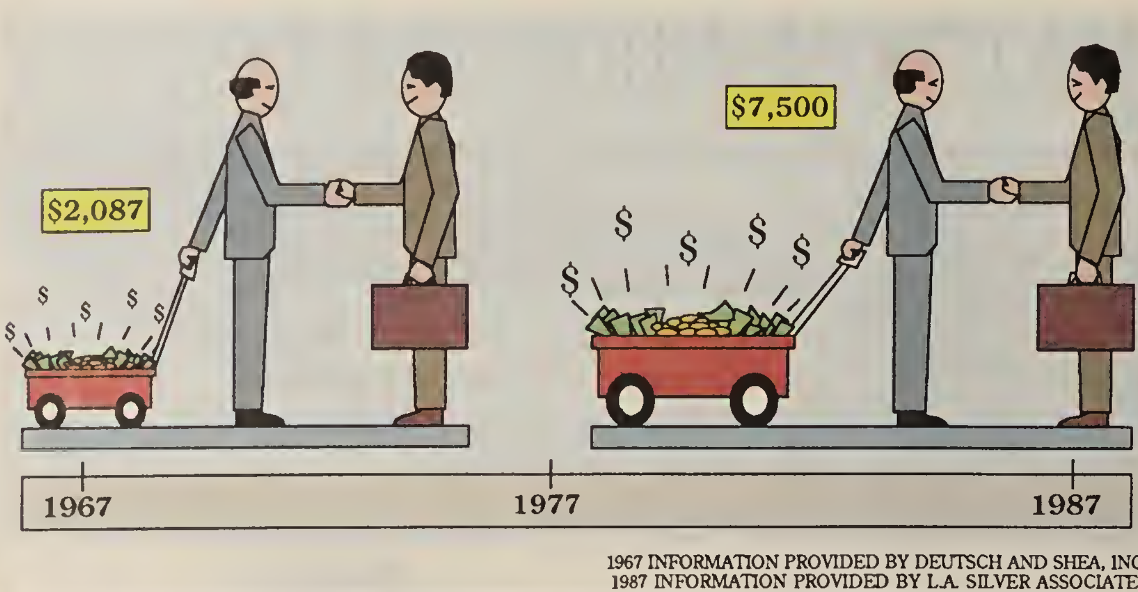
In late May 1967, I was in New York visiting the DP managers of a number of large user organizations. I discovered these managers were having difficulty getting enough information to evaluate vendors other than their own suppliers. I realized that if the industry was going to grow, and innovative new products succeed, DP professionals would need a timely vehicle to inform them as to the new products and services available. I conceived *Computerworld* as the users' advocate, a newspaper reporting on new products and the successes and failures of their use.

PATRICK MCGOVERN

How did users react?

Our subscribers found our editorial content a refreshing change, providing insight they could rely on. We were willing to sharply criticize products and vendors — something our competition was not noted for. I am proud to say we still have that reputation 20 years later.

Continued on page 20th/2



Average cost per hire of DP professionals

- The amount the average company spends to hire a data processing professional increased 259% since 1967

1967 INFORMATION PROVIDED BY DEUTSCH AND SHEA, INC.
1987 INFORMATION PROVIDED BY L.A. SILVER ASSOCIATES
CW ILLUSTRATION: SUSAN ALDAM

Continued from page 20th/1

How did the competition react?
Competitive publications didn't pay much attention to us. No one expected *Computerworld* to succeed against major competitors like *Datamation*. Then, six months later, a circulation study found that *Computerworld* was more widely read than any other computer publication. The study also revealed that it was very influential in helping users make their buying decisions. By 1972, we had the largest ad revenue in the industry.

How has *Computerworld* changed?
Computerworld's basic mission has not changed. We still support the needs of information systems professionals and their staffs; we are not tied to a particular technology, like many of our competitors. We conduct readership surveys to stay in touch with our audience. Today, you'll see articles on a variety of topics that are important to our readers.

What is the No. 1 challenge facing your readers today?
In the past, our readers were responsible for managing systems that were completely under their control. Today, computing power has spread outside the data center. MIS professionals must balance the management of centralized processing with distributed processing, dealing with training, security, PC acquisition. *Computerworld* runs regular features to help readers deal with these challenges.

What do you think the future will be like for the information community?
Over the next two decades, computing power will become directly available to more than one billion people. They will rely on computer technology for information retrieval and communications in the same way they use the telephone and broadcast media today. People's personal and economic accomplishments will be tied to their knowledge of computing.

In business, the MIS professional's role will continue to expand as he supports the strategic direction of the company. Even today, we see chief information officers making high-level policy decisions. More companies will require a worldwide strategy for information systems development and management.

What role will *Computerworld* play in this future?
Computerworld's role, as it is today, will be to help those individuals charged with harnessing the power of information technology. Twenty years from now, it will reach a much broader audience. As information technology becomes an indispensable part of decision making in every industry, we will see the number of professionals grow. We will track their needs and design *Computerworld* in response to them, just as we do today.

What also intrigues me is the potential of delivering *Computerworld* electronically. Some information will be presented to our readers in a packaged format, organized by our editors and writers or compiled on data bases available at the request of users. *Computerworld* will increasingly use on-line delivery, video and voice messaging as well as printed media to deliver information to our readers in the right form at the right time.

"Ok...
But why
Tandy
Computers?"

"In a word...quality."

Tandy® computers are designed, built, supported and serviced by Radio Shack. Our total commitment assures a high degree of product quality and, just as important, customer satisfaction long after the sale.

Tandy 3000 HD

Quality-built in the USA. Our MS-DOS® personal computer line is made in America in our own manufacturing plants. We control quality, from initial assembly to completed and tested product.

Nationwide Support. Over 1200 Radio Shack Computer Centers are staffed with professionals. They're ready to help you choose the latest in computer technology, backed by quality support.

Tandy 3000 HL

Training and specialized software instruction are available at your place of business or ours, in 60 U.S. markets.

Tandy 1000 SX

We've got what it takes. Like commercial leasing plans. And prompt, reliable service performed by technicians who work for the same company that manufactured and sold you your computer.

Manufacturing. Service. Support. You expect quality . . . and get it with Tandy Computers.

TANDY COMPUTERS: In Business . . . for Business℠

Radio Shack
COMPUTER CENTERS
A DIVISION OF TANDY CORPORATION

MS-DOS/Reg. TM Microsoft Corp.

WITHOUT DATA GENERAL, INTEGRATING YOUR SYSTEMS IS LIKE MIXING OIL AND WATER.

FOR FULLY INTEGRATED BUSINESS AUTOMATION, TALK TO DATA GENERAL.

To maintain a competitive edge, a business needs to integrate all its resources. Ultimately blending people, departments, data and computer systems together.

Data General's Business Automation Systems integrate all these vital elements. Which gives your company one, accessible information flow.

Our industry-leading CEO® software gives you the most integrated business automation essentials. With spreadsheets. Graphics. Decision support. Tools that help you make faster, better informed business decisions.

Then we take you further. By letting you integrate your existing applications.

Our communications story is second to none. We give you the most complete IBM compatibility. We also adhere to industry standards like Ethernet® and X.25.

So our business automation solutions integrate all levels of your company. From PC's to mainframes. And from the next room to the next continent.

Our MV/Family systems lead the industry in price/performance. And give you a low cost of ownership, along with service, training and support.

Today, over 165,000 CEO users have discovered true integrated business automation. To create the best possible blend for your business systems, talk to Data General. Call 1-800-DATAGEN (Canada call 1-800-268-5454.) Or write: Data General, 4400 Computer Drive, MS C-228, Westboro, MA 01580.

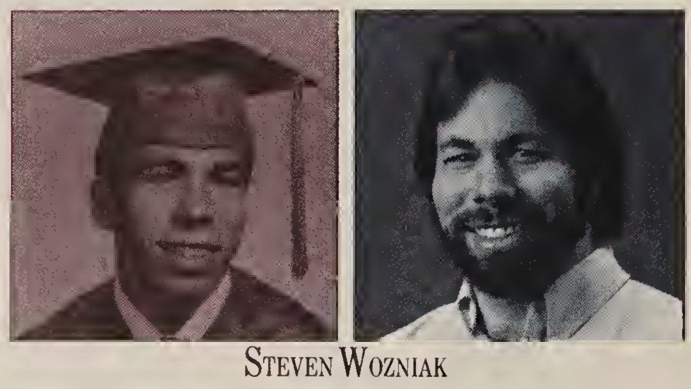
Data General
a Generation ahead.

©1987 Data General Corporation. CEO is a registered trademark of Data General Corporation. Ethernet is a registered trademark of Xerox Corporation.

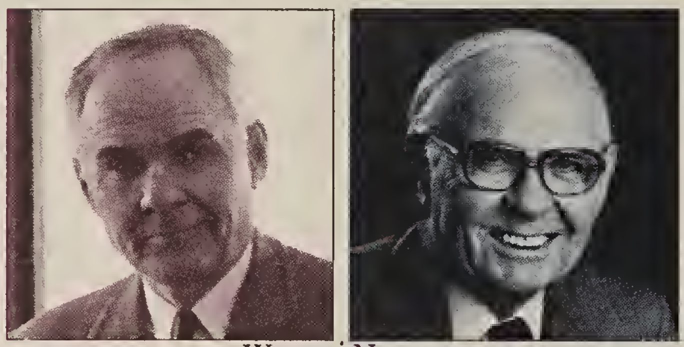
Where were you in '67?

Twenty years ago, the Boston Computer Society's Jonathan Rotenberg was learning to walk, Borland International's Philippe Kahn was learning to ski, and Apple Computer's Steve Wozniak was walking down the aisle in his high school graduation cap and gown.

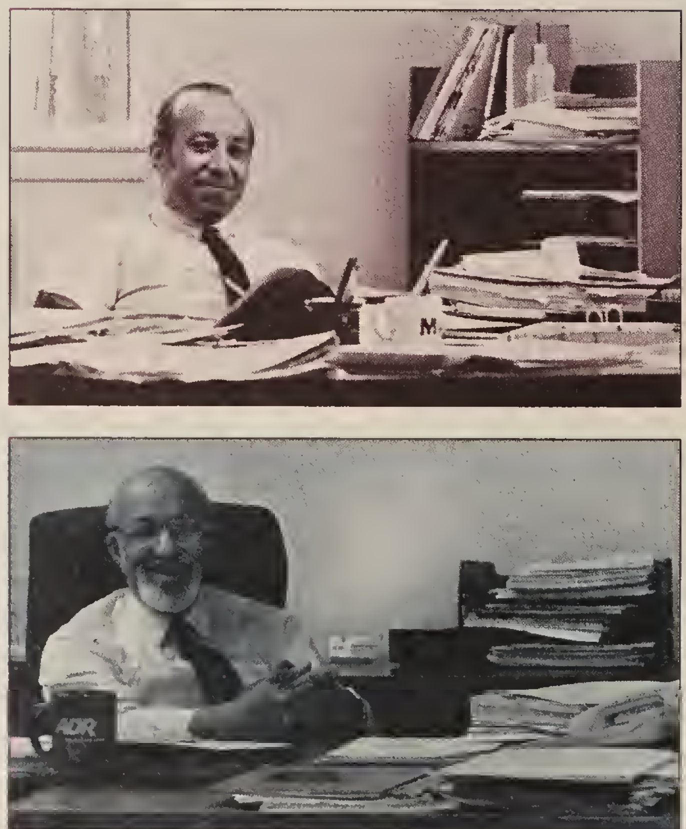
At about the same time, Gene Amdahl was working for IBM and Adam Osborne was completing his Ph.D. in chemical engineering. Our industry leaders have packed a lot of experience into 20 years. Here is a look, past and present, at a few familiar faces.



STEVEN WOZNIAK
Apple Fellow and Cofounder
APPLE COMPUTER, INC.

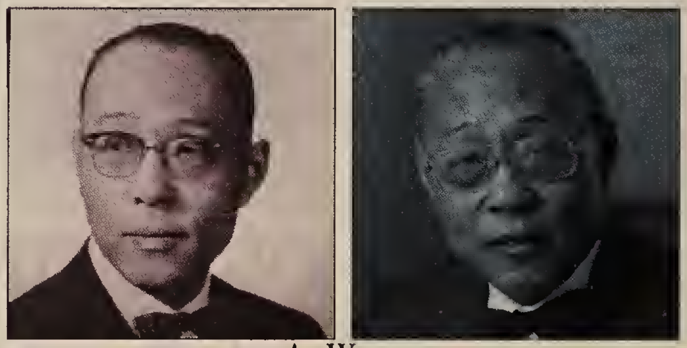


WILLIAM NORRIS
Chairman Emeritus
CONTROL DATA CORP.



MARTIN GOETZ
Senior Vice-President
APPLIED DATA RESEARCH, INC.

THOMAS KURTZ, JOHN KEMENY
Kurtz: Chairman of Computers and Information Systems
Kemeny: Professor of Math and Computer Science
DARTMOUTH COLLEGE



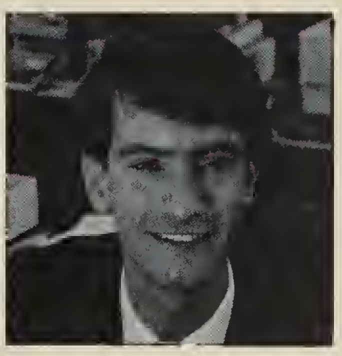
AN WANG
Chairman
WANG LABORATORIES, INC.

FRED WANG
President and Treasurer
WANG LABORATORIES, INC.

DANIEL BRICKLIN
President
SOFTWARE GARDEN, INC.

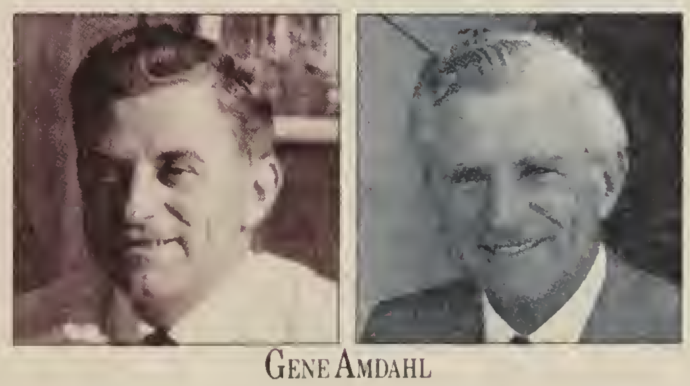
PHILIPPE KAHN
President
BORLAND INTERNATIONAL

ADAM OSBORNE
President
PAPERBACK SOFTWARE, INC.



JONATHAN ROTENBERG
President
BOSTON COMPUTER SOCIETY

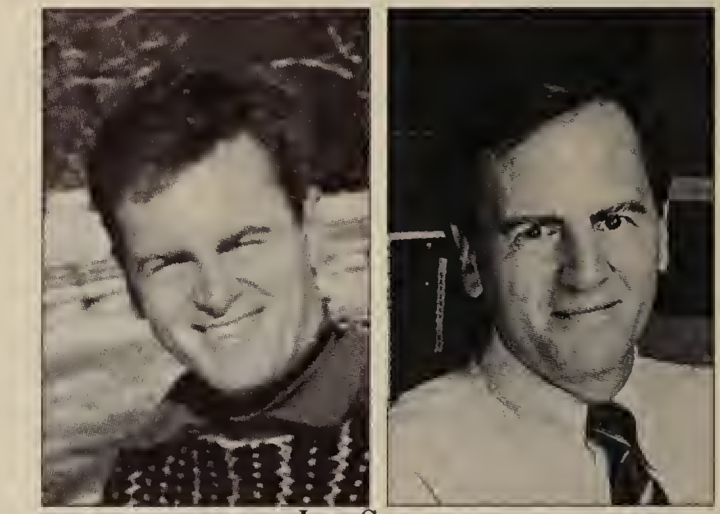
JOHN IMLAY JR.
Chairman and CEO
MANAGEMENT SCIENCE AMERICA, INC.



GENE AMDAHL
President
MODULAR POWER CORP.

The many faces of Computerworld

H. Ross Perot
Industrialist/Founder
ELECTRONIC DATA SYSTEMS CORP.



John Sculley
Chairman and CEO
APPLE COMPUTER, INC.

Gary Kildall
Chairman
DIGITAL RESEARCH, INC.

Edson DeCastro
Chairman and President
DATA GENERAL CORP.

UNIX?* YES. UBACKUP?™ NO... UDEAD.

UBACKUP, USECURE, UQUEUE, UCONTROL from UNITECH Software. System administration software to manage your UNIX environment.

For information, UCALL **(703) 860-3000**

UNITECH Software, Inc., 1800 Alexander Bell Drive, Suite 101, Reston, VA 22091, Telex 197817 UNITEC UT

*UNIX is a trademark of AT&T. UBACKUP, USECURE, UQUEUE, and UCONTROL are trademarks of UNITECH Software, Inc.

UNITECH SOFTWARE INC

REACH OVER 70,000 FRENCH COMPUTER PROFESSIONALS.

Advertise in CW Communications' French publications and sell your products to the second-largest computer market in Western Europe.

Each week 25,000 MIS/DP executives read *Le Monde Informatique* to keep abreast of the latest developments in the industry.

Each month *InfoPC* reaches 30,000 IBM PC users and potential buyers. This publication has become France's leading monthly magazine dedicated to the IBM PC and compatibles market.

Distributique is read each month by 8,500 computer distributors and retailing professionals.

Le Monde des Telecoms is CW Communications' newest publication in the French market. This monthly tabloid is written for 10,000 telecommunications decision makers.

CW International Marketing Services makes advertising your products in France, and around the world, easy. We have over 55 publications in 28 countries. **For advertising information, please call Frank Cutitta, Managing Director, International Marketing Services at 800-343-6474 (in MA 617-879-0700).**

CW COMMUNICATIONS/INC.
International Marketing Services
French Desk
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171
617-879-0700/800-343-6474

an International Data Group company

"YOU CAN'T DO THAT"

Build a large scale mainframe computer that will outperform the competition's leading model?

"IMPOSSIBLE!" they said.

But Amdahl did it back in the early 1970's. And today we are a leader in the development, manufacturing, marketing and support of general purpose and scientific computer systems, storage products, communications systems and software.

In less than two decades we have grown from 5 to more than 7,000 "can do" employees around the globe. Our success is a result of teamwork, innovation and commitment to achieve the impossible. If you are ready for challenge, creativity and growth, explore your opportunities with Amdahl in one of the following areas.

SOFTWARE/HARDWARE DEVELOPMENT & SUPPORT

YOU CAN develop a new, large mainframe operating system that is self-tuning and does not require system generation. Use your 3+ years' operating system development experience to join this key area.

YOU CAN use your 3+ years' experience with 370 and/or 370/XA architecture, Assembler and MVS, VM or UNIX* internals to develop operating systems software for our future products

YOU CAN "make" the kernel in 3 minutes! Use your 3+ years' development experience in UNIX* and/or 370 operating systems to join our UTS** development team.

YOU CAN join an entirely new project to bring program compatibility and interoperability to the SNA and OSI environments. We're using some of the most sophisticated software tools to do it. UNIX* System V Release 3 STREAMS for one. Our own mainframe UNIX* timesharing system — UTS** — for another. Use your 3+ years' SNA, OSI or X.25 experience to develop network architectures and communications software.

MANAGEMENT INFORMATION SERVICES

YOU CAN work in one of the largest data centers in the country and apply your 4+ years' experience with IDMS and ADS/O, or your 4+ years' programming experience with higher level or end user languages, such as SAS or FOCUS, in areas like new data base technology (IDMS systems), 4GL and new subject data bases.

YOU CAN also work on our state-of-the-art UTS** (UNIX*) systems and be involved in the use of leading edge software including VM/HPO, VM/VTAM and SNA.

MARKETING

YOU CAN support Amdahl's marketing and sales efforts by using your 8+ years' data processing, marketing and/or sales experience to define market requirements for new communications products and strategies. Or, use your 7+ years' large mainframe data processing experience (including 4 years in sales, marketing or sales support) to define marketplace requirements, create marketing plans and provide demand forecasts for future storage products or future processors.

YOU CAN enjoy the benefits and competitive salary you would expect from an industry leader. To apply, send your resume to: **Amdahl Corporation, Employment Department, Dept. 6-8, P.O. Box 3470, M/S 300, Sunnyvale, California 94088-3470.** Principals only please.

YOU CAN call on your PC or terminal, 24 hours a day, for job opportunities or to enter your resume. **Dial (612) 941-5723 and enter the password "AMDAHL".**

YOU CAN AT

amdahl

---

*UNIX is a registered trademark of AT & T.
**UTS is a trademark of Amdahl Corporation.

Amdahl Corporation is proud to be an equal opportunity employer through affirmative action.

BY MICHAEL HAMMER

Back to the future

What was the world like when the first MIS amphibian crawled out of the primordial ooze? What did it see when it raised its head? Hardware.

An "oxymoron" is not a dull-witted bovine but a phrase that contains an internal contradiction, such as "jumbo shrimp," "airline food" or "information systems management." Accordingly, a cynic might argue that asking, How is the management of information systems changing? is akin to asking, When did you stop beating your end users? But we are not cynics, and so we shall ask that question and seek to resolve it.

The checkered history of information systems is replete with its own myths, epochal events and great ages. In the beginning, there was the Classical Era (10,000,000 B.C. to A.D. 1972), also known as Pax Cyberneticus. During this period, computers were enormous and expensive devices, the mysteries of which were revealed only to the initiated. They were established in great Grecian temples, surrounded by barbed wire and ministered to by cults of priests in long white robes known as systems programmers.

If you were a member of the peasantry — such as a business manager — and wished to consult the great oracle for information or support for a business function, you had to bring a freshly slaughtered goat to the temple and knock your forehead on the ground three times. Perhaps you got your information, perhaps you got your support, but you certainly did not get your goat back.

This era was followed by such legendary events as the Persecution of the Users and heroic periods like the Age of the Robber Barons.

TODAY'S SYSTEMS ENVIRONMENT CANNOT BE MANAGED FROM BEHIND THE HIGH WALL, HAMMER MAINTAINS.

GEOFF O'CONNELL

Therapy groups for MIS victims

The legacies of this history persist even today. I recently learned that at a certain Fortune 10 company, DP was the most hated part of the organization. This did not particularly distress or surprise me until they added "even worse than the controller." In a similar vein, I am sometimes called upon to run therapy groups for users who have been traumatized by their experiences with MIS. When the participants are asked to free-associate and provide the words that MIS connotes for them, such submissions as "ponderous," "slow," "unresponsive," "out of touch" and "managed by weirdos" usually top the list.

Yet as Stalinists, Hegelians, Red Sox fans and other historical determinists would say, "It is no accident." That is, the problems afflicting MIS and its relationships with users are not coincidental, not the by-product of bad policy on the part of MIS management, but rather the inevitable consequences of the systems environment with which we have had to contend. If we are to remedy these problems, we need to understand their origins and how changes will allow us to free ourselves from the dead hand of history.

Organizations, like organisms, are products of their environments. What was the world like when the first information systems amphibian crawled out of the primordial ooze? What did it see when it first raised its head? It saw hardware. In brief, the hardware was expensive, complex, large-scale, environmentally finicky and marginally reliable. Other than that, it was terrific. And software? Because of the limitations of the hardware, our only objective was getting the damn stuff to run on the pokey machine. So we used primitive tools and endured unendurable interfaces and sacrificed nights on the altar of throughput and response time.

And to what noble purposes did we put these technological behemoths? For what business activities were these marvels of the modern world used? For bookkeeping, for financial accounting, for the administrative automation of the back office. You remember the back office — that endless wasteland of filing cabinets, cheap desks and glaring lights. The back office is the part of the organization in which we do the work we need to do to stay in business, not the work we went into business to do.

The real work of a company revolves around product design, manufacturing, planning, marketing and sales. As a by-product — or waste product — of this work, every company finds itself saddled with billing, invoicing, accounting, payroll and similar tasks. These back-office processes are large-volume, repetitive, highly structured and labor-intensive. Our motivation in automating them was straightforward: to arrest the relentless increase in their costs that accompanied the dramatic growth in business volume and revenue that characterized the '60s and '70s. In fact, computing technology was the only weapon in management's arsenal to combat the diseconomies of scale associated with the administrative paperwork processing of the back office.

As an illustration, consider a situation in which an organization has to process 100 transactions per hour and has access to clerks who can individually handle 10 transactions per hour. Advanced mathematics demonstrates that 11 people are needed in the unit that will process the transactions: 10 clerks and one supervisor. Now imagine a tenfold increase in volume to 1,000 transactions per hour; How many people are needed now? Arithmetic suggests 110, recursive function theory 111.

However, survivors of organizational growth know that the correct answer is 193: 100 clerks, 10 supervisors, one department manager, three deputy department managers, 18 people in a human resources organization, 19 people in long-range planning, 20 in facilitation and expediting and 22 in audit and control. This growth reflects not only the inevitable bureaucratic proliferation of a large organization, but also the complications that result from scaling up any labor-intensive work.

Systems were necessary, but not important

Back-office processes are not unnecessary activities, but they are relatively unimportant in the larger scheme of things. They are ancillary to the organization's primary focus. The purpose of the organization is not to pay the payroll (unless the organization is Automatic Data Processing, Inc.). Admittedly, it is difficult to motivate employees to come to work in the morning unless they are paid with some regularity, but that is the means, not the end. In short, while systems were necessary, they were not important. The computer was viewed by the rest of the corporation as less interesting than the copying machine, and the DP staff was viewed as people not creative enough to be bookkeepers.

DP responded to this environment by erecting and retreating behind a high wall that separated it from the rest of the organization. On our side, the primary concern was the care and nurturing of the machines. Keeping the damned things

---

Hammer is principal at Hammer and Co., a Cambridge, Mass.-based consultancy that specializes in the development and application of information technologies.

JERZY KOLACZ

THE MIS MANAGER EMERGES FROM THE INSULATION OF THE OLD-STYLE DP COCOON, NOW INTEGRATED INTO AND SUPPORTIVE OF THE LARGER ORGANIZATION'S GOALS.

Flashbacks

JULY 26, 1967

ARE WOMEN A PROBLEM?

Computerworld's Personal Page editor suggests that women are a problem in the field of data processing. He says that women create problems for others and find problems for themselves.

He adds, "A woman among men can be a dove among crows, and it's a manager's job to keep it that way."

NOVEMBER 29, 1967

MY CUSTOMER ENGINEER? HE'S DOWN AT HIS TV SHOP!

Computer Communications, Inc. adapts standard black-and-white television sets as communications stations, or operator display stations. President Robert Fagan looks to the day when general-purpose computer TV terminals will be as common as electric typewriters at secretaries' desks and will be used to access files in computers located miles away.

MAY 1, 1968

COMPUTER SERVES 113 AT ONCE

The Dartmouth College Kiewit Computation Center in Hanover, N.H., sets what it believes to be a world record when it connects 113 simultaneous active users to its General Electric Co. 635 timesharing system with no perceived degradation in response time.

AUGUST 28, 1968

FIRST MAN TO SWIM BAY HAS HELP FROM COMPUTER

Forty-one-year-old Russell Chaffee, an eighth- and 10th-grade math teacher from Sayre, Pa., uses a computer to plot the tide flows of Cape Cod Bay and steps ashore as the first person to swim the 19-mile bay nonstop. The trip takes him 14 hours. Chaffee credits a computer study he did with saving five or six miles of swimming.

JUNE 11, 1969

L.A. COURT UPHOLDS RIGHT TO SUE DP SERVICE

The Los Angeles Superior Court rules that plaintiffs have a legal right to sue computer service companies for punitive damages. Judge Robert W. Kenny upholds Southern California Retailers Credit Service Co.'s claim against Statistical Tabulating Corp. for $1 million in punitive damages and more than $2 million total.

running and implementing any application more complicated than a sort routine occupied all our energy and attention. We had none to spare for the masses on the other side. In fact, the world beyond the wall had no objective reality for us; it existed only as specifications for our Cobol code.

Not surprisingly, communications between the two worlds were limited and usually accomplished by missives thrown over the wall — requests and authorizations on their part, specifications and completed systems on ours. MIS and the user did not understand each other nor speak each other's language. On those rare occasions when we met users face to face, the resulting conversation consisted of a series of mutually unintelligible grunts:

User: The EVP is concerned about our costs of funds and the Fed's plans for Regulation Q, so we'll need a system to play the gap.

MIS: The distributed free space in VSAM is breaking along segment boundaries, and the double page faults are killing file system performance.

User: Huh?

MIS: Huh?

Priests of High Seriousness

Living behind the wall, we became cautious and conservative to a fault. We suppressed our natural inclinations to see the computer as a device for our own amusement and systems development as an esoteric form of intellectual amusement.

Rather, we managed our responsibilities with a High Seriousness, employed a methodology for every task in sight and documented and audited like the obsessive-compulsives we were quickly becoming. We became inner-directed, solipsistic, introverted. Our watchwords were control and discipline, and our apotheosis was the system programmer: Totally embroiled in the mysteries of the machine, contemptuous of the "real world" he deigned to serve.

After a time, we even made a virtue of our predicament. It was good to live behind the wall, we decided. After all, we were not in the banking business or the automobile business or the textile business or whatever business our users of the moment happened to be in. We were in the systems business, a "business within the business." Our users were our customers, and our mission was to deliver the products that they requested of us.

Saying 'cheese'

While this customer-oriented view required us to smile a bit more at users than would have been our natural wont, it also provided us with a satisfying image of self and a self-contained definition of our enterprise. The Great Wall of China was built to keep out the barbarians. Our wall had the same purpose, but who is to say on which side the barbarians lurked?

Our sheltered information systems workshop has stood us in good stead for many years, but it is unable to withstand the winds of change now blowing at gale force. While the change factors bringing about its demise are many and diverse, three stand out above all:

- Technology change. This is The Cause that drives all others. Despite the efforts of the many pundits, it is impossible to make this a vacuous cliche. The 10,000-fold improvement in price/performance that we have witnessed has had dramatic effects on system availability, affordability and manageability; it has given us the excess capacity needed to reduce the complexity of applications development, to develop systems with less painful interfaces and to employ tools that shield us from the vagaries of the hardware.

Above all, technology improvements have enormously expanded the scope of information systems, allowing us to implement facilities that in the past were either uneconomical — word processors, spreadsheets, decision-support systems — or simply unfeasible — integrated manufacturing systems, customer communications systems.

- User empowerment. In the Golden Age, users would cower under their beds if we growled, "JES3" or "VTAM." Today, they are likely to sneer and start talking about Unix and PS/2. Users have decided that computers are in fact comprehensible by mere mortals. They feel enormously more comfortable using systems and are far more interested in seeing them employed in their business environments.
- New application types. A new generation of applications is now being implemented. These contemporary systems come in two major flavors: support systems and transformational systems.

Support systems encompass the technologies that go by the names of personal computing, information centers, decision-support systems, office automation and a long list of other buzzwords that grows daily.

The essence of support systems is that they do not attempt to automate processes but to leverage people. By providing professionals and managers with information and the tools to use it, support systems allow people to perform their jobs in different — and presumably better — ways.

Transformational systems are those in which information technology is used to introduce basic change into fundamental business processes: sales, marketing, manufacturing and research and development. Rather than increase local efficiency, transformational systems entail global restructuring of an organization and its activities in order to achieve new — and not just faster or better — ways of doing things.

Transformational systems include most of the "competitive" or "strategic" applications that have given the trade press something about which to write now that everyone is thoroughly tired of hearing about personal computers.

Both support and transformational systems represent the utilization of systems in the essence of the business rather than just in the back office.

Tear down the wall

These basic changes will force us to tear down the wall behind which we have hidden for so long. In the past, the wall did not seriously interfere with our ability to develop systems, because the systems we were building were in fact relatively simple: To be precise, we were automating already existing administrative processes.

It was not necessary to speak the same language as the users or to understand them; with hand signals, they could point to the processes to be automated, which we could examine in operation and replicate in software. Yesterday's systems development environment was in fact relatively clear. The users knew more or less what they wanted, and our job was to build it for them.

Flashbacks

DECEMBER 3, 1969

ANTIWAR PROTESTERS ERASE DOW TAPES

Beaver 55, a group protesting the Vietnam War, erases more than 1,000 tapes at a Dow Chemical Co. computer center, charging that the tapes were used to store data from "research into such areas as nerve gases, napalm, defoliants and other secret chemical weaponry."

Dow denies the charges.

JULY 1, 1970

DP CENTER NOISE MAY CAUSE LOSS OF HEARING

A National Bureau of Standards investigation reveals noise levels in computer centers frequently cause permanent hearing damage in addition to "relatively simple errors by programmers."

DECEMBER 8, 1971

U.S. COMPUTERS 'AID' APARTHEID

The American Committee on Africa implicates computers as the chief U.S. contributor to South African apartheid. Under a Population Registration Act passed by the South African Parliament in 1970, the government will computerize a record system to compile dossiers on all South African blacks. The system will run on an IBM 360/50.

FEBRUARY 16, 1972

MAGNETS' DANGER TO TAPE 'HOGWASH'

Researchers at the Stanford Research Institute dismiss fears that an intruder carrying a concealed magnet could wipe out a tape library as "hogwash." This is not to say that magnets cannot erase tapes — anyone carrying a 100-lb magnet into a tape library could do considerable damage, but such a person, researchers point out, would hardly go unnoticed.

MARCH 22, 1972

JUDGE RULES AGAINST 'DP ERROR' DEFENSE

A company is responsible for the actions of its computer, the 10th Circuit Court of Appeals in Denver says when it rules against State Farm Mutual Insurance Co., which claimed it was not liable under a canceled insurance policy that was renewed by the firm's computer system.

AUGUST 22, 1973

DP WORKERS STRIKE FOR BETTER STATUS

Some 45 Rhode Island state government programmers and keypunch operators stage a wildcat three-day "sick-out" to protest their lack of advancement opportunities.

MARCH 6, 1974

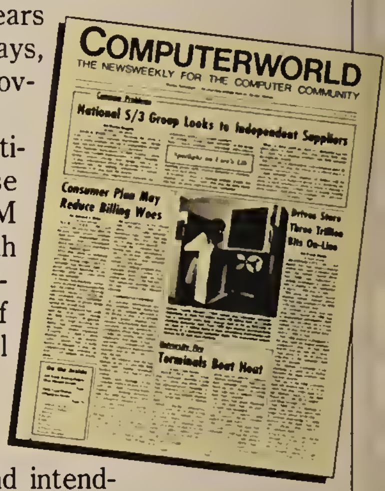
NIXON WANTS PRIVACY SHIELD FOR ALL

President Richard Nixon orders a top-level review of the issue of personal privacy — particularly in relation to computerized data banks — and calls for "a personal shield for every American" against invasions of privacy.

MAY 28, 1975

GOVERNMENT OPENS ANTITRUST CASE AGAINST IBM

After six years and 122 days, the U.S. government's massive antitrust case against IBM opens with the U.S. Department of Justice legal team charging that "IBM monopolized and intended to monopolize the general-purpose electronic digital computer systems market" and related peripherals and leasing markets. Justice charges that IBM had the power to fix prices from 1960 to 1972. Frank T. Cary listens impassively to the charges against the $1 billion-a-year firm he heads as chairman.



COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
National S/3 Group Looks to Independent Suppliers
Consumer Plan May Reduce Billing Woes
Drives Store Three Trillion Bits On-Line
Terminals Beat Heat

DECEMBER 24, 1975

POLICE SUED; OUTDATED NCIC FILE CITED

Failure to update the National Crime Information Center's (NCIC) wanted-persons file results in a $100,000 lawsuit against seven police officers. A Dover, N.H., man claims he was "rousted" from bed and shepherded to the local police station where he was questioned for four hours by officers who said his name matched an alias in the NCIC's file.

AUGUST 16, 1976

WORLD SEEN APPROACHING 'DATA SPASM'

The world is barreling toward a "data spasm" of transnational data flow that operates under no restraint or accountability, according to Joseph Overton, legislative assistant to Rep. Barry Goldwater Jr. (R-Calif.), who spoke to attendees at the International Conference on Computer Communication in Toronto.

This happy state of affairs no longer obtains. Modern systems are not implemented from a predetermined set of specifications; they evolve in a process of mutual adaptation between user requirements and systems capabilities.

The user of a modern system does not know exactly what he needs of a system when he asks for it. He vaguely understands the potentials of information technology, but he does not comprehend how his personal activities or business operations can be radically changed through the power of systems. The user may express to us his articulated wants, but not his unrecognized needs.

Contemporary systems are distinctive in that they are disruptive. They provide users with capabilities the users never had in the past; the systems themselves created the needs they satisfy. They force the user to rethink how the essence of his business can be conducted. Such systems must be developed in an environment of learning and feedback, an environment not consistent with high walls.

And if by some chance we do get a system developed, throwing it back over the wall is not a satisfactory way to conclude our involvement with it. Today, systems entail substantial organizational change. They do not leave their environments undisturbed. Rather, they result in significant changes to individual work styles, job definitions and organizational boundaries.

Out from behind the high wall

Today's systems environment cannot be managed from behind the high wall. We no longer have the luxury of waiting for users to come to us with fully articulated needs. In the first place, they may not come to us at all, emboldened as they are by their apparent successes with PCs; they may undertake the effort on their own. And if they do come to us, they may not know what to say. Users once said, "Build what we ask for." Now they say, "Tell us what we should ask for."

It is incumbent upon information systems to sally forth from behind our ramparts and to get deeply involved in the world beyond the wall. Tasks are no longer neatly divided between the users and ourselves — needs identification and systems implementation to the user, design and development to us.

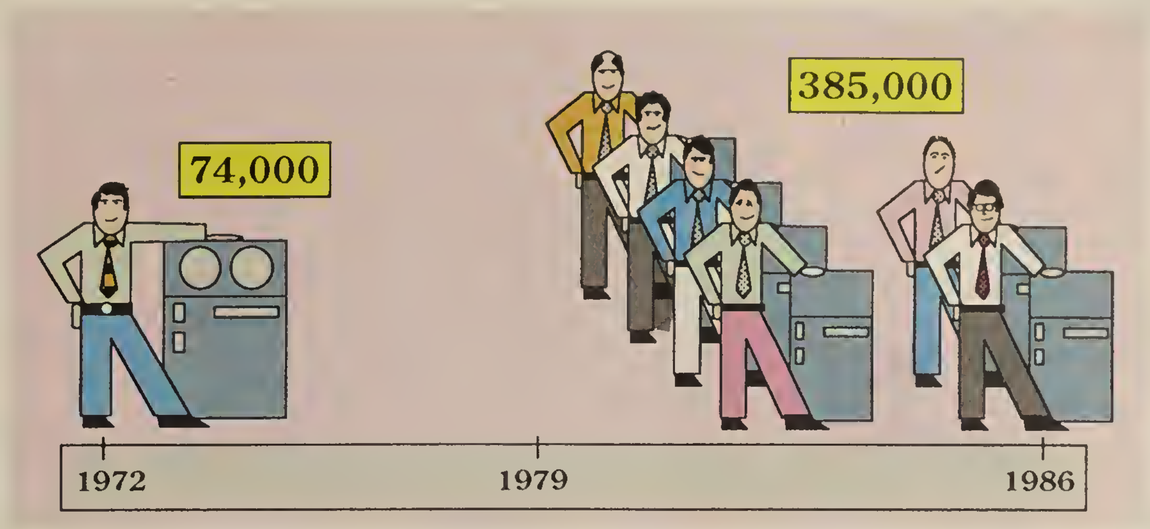
Rather, we must work in partnership with users on the entire process, from the initial business analyses that identify general system requirements through the management of the organizational change that is inevitably attendant on an important system.

Down from the tower

This is much more than a cosmetic change. On the one hand, the scope of information systems activities will broaden considerably beyond the traditional confines of technology management. On the other, we will no longer have sole dominion over the technology domain, since today's user feels empowered to participate with us there.

Our business will no longer be computer systems; our business will be the same as the larger organization of which we are a part, and computer systems will just be an area in which we have a bit more competence and a bit more expertise than do our colleagues — not users or customers.

This transition is not a modest one. We have embarked on a new enterprise with a new mission, new responsibilities and new requirements. In the old days, our



Demand for systems analysts skyrockets

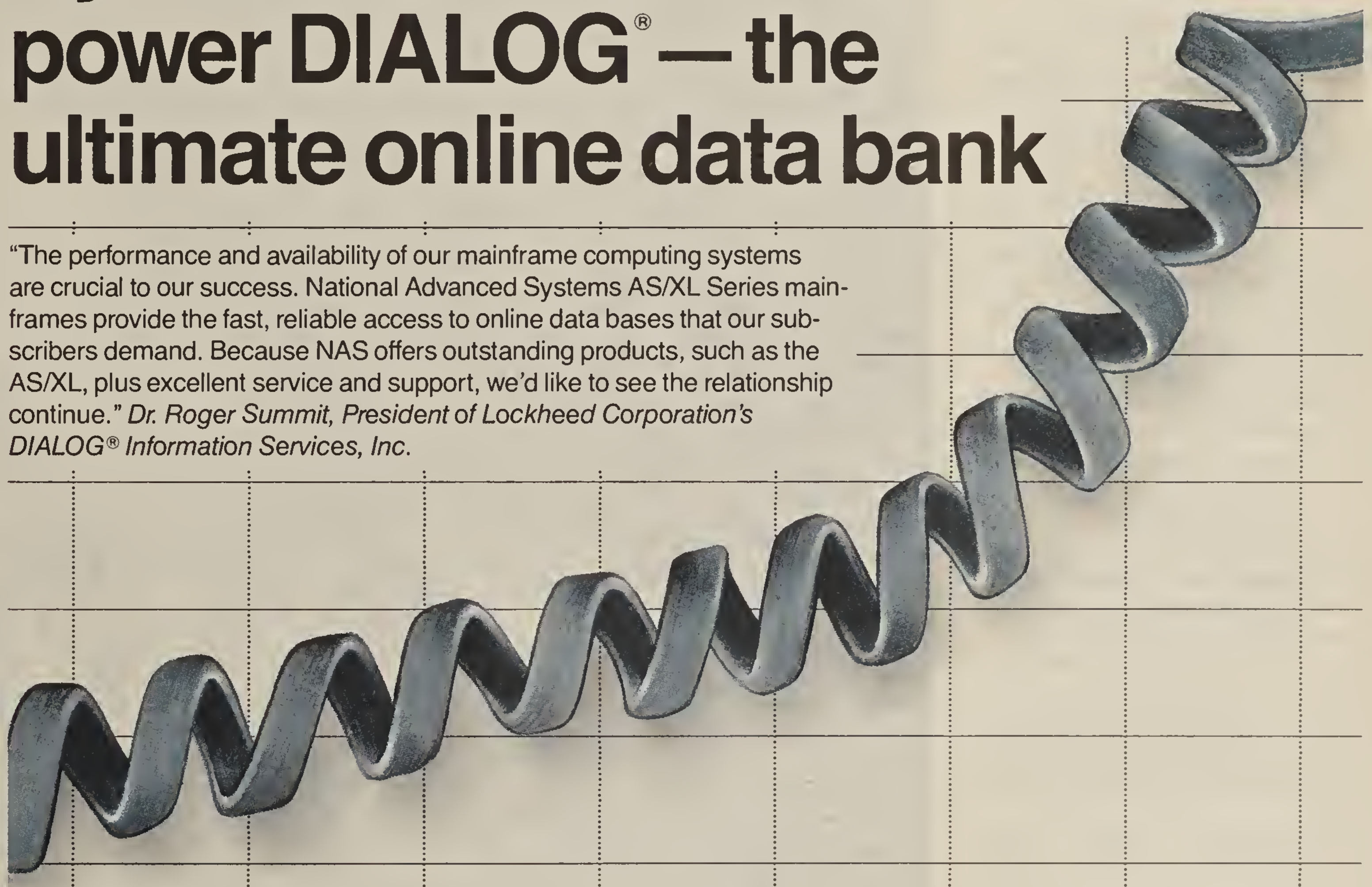
• The number of systems analysts employed has boomed since the census began counting computer occupations, with 420% growth in 14 years

INFORMATION PROVIDED BY THE U.S. BUREAU OF LABOR STATISTICS, OFFICE OF ECONOMIC GROWTH AND EMPLOYMENT PROJECTIONS
CW ILLUSTRATION: MITCHELL J. HAYES

National Advanced Systems

National Advanced Systems mainframes power DIALOG® — the ultimate online data bank

"The performance and availability of our mainframe computing systems are crucial to our success. National Advanced Systems AS/XL Series mainframes provide the fast, reliable access to online data bases that our subscribers demand. Because NAS offers outstanding products, such as the AS/XL, plus excellent service and support, we'd like to see the relationship continue." *Dr. Roger Summit, President of Lockheed Corporation's DIALOG® Information Services, Inc.*



Lockheed Corporation's DIALOG Information Services, Inc. provides the world's largest collection of online information. With over 120 million entries in more than 270 data bases, DIALOG is rightfully known as the ultimate online data bank. A few minutes online with DIALOG can retrieve data that would otherwise require hours of tedious search in a conventional library.

Mainframe computing is DIALOG's lifeblood. Over 80,000 subscribers worldwide rely on DIALOG to systematically access the world's knowledge base. DIALOG, in turn, relies on National Advanced Systems AS/XL Series mainframes and 7380 Disk Storage Subsystems for reliable, lightning-fast computing power.

DIALOG knows the value of peak mainframe performance from National Advanced Systems. But then knowledge is their business.

National Advanced Systems customers, such as DIALOG, buy our products because they perform. They keep them because we perform. Our mainframes and storage systems are renowned for quality and reliability unsurpassed in the IBM-compatible marketplace. We add to this exceptional value with a very simple feature. We listen. We work closely with you to provide innovative solutions that meet your unique requirements. We back up these solutions with the top-ranked service and support in the industry.

To get peak performance from your data center, write John Diedenhofen, Vice President of Marketing, MS 52, P.O. Box 7300, Mountain View, CA 94039. Or, call 415-962-6100.

The preferred choice of informed mainframe and storage systems users around the world

definitions of success were clear: availability, response time, system delivery on time and under budget. What the user did with the system after delivery was his problem; as long as the system worked, we did not care whether the intended business benefits were in fact achieved. This perspective is now obsolete.

Our mission must be to help ensure that the users achieve business success, however we can best contribute to it. We will have to become intimately involved with the users and their business and work in close harmony with both.

This role will demand new skills: business analysis, methods engineering, change agentry. Even more important, it will require new styles and attitudes not normally associated with MIS. Our new role will demand humility, since we will no longer be able to point to an independent enterprise and declare it ours; rather, we will play a supporting role across all business domains.

We will also need to cope with a different set of pressures. In the past, our role model was Mr. Spock: rational, analytic, precise. We thrived despite overwork and disaster, but we could not tolerate ambiguity and imprecision.

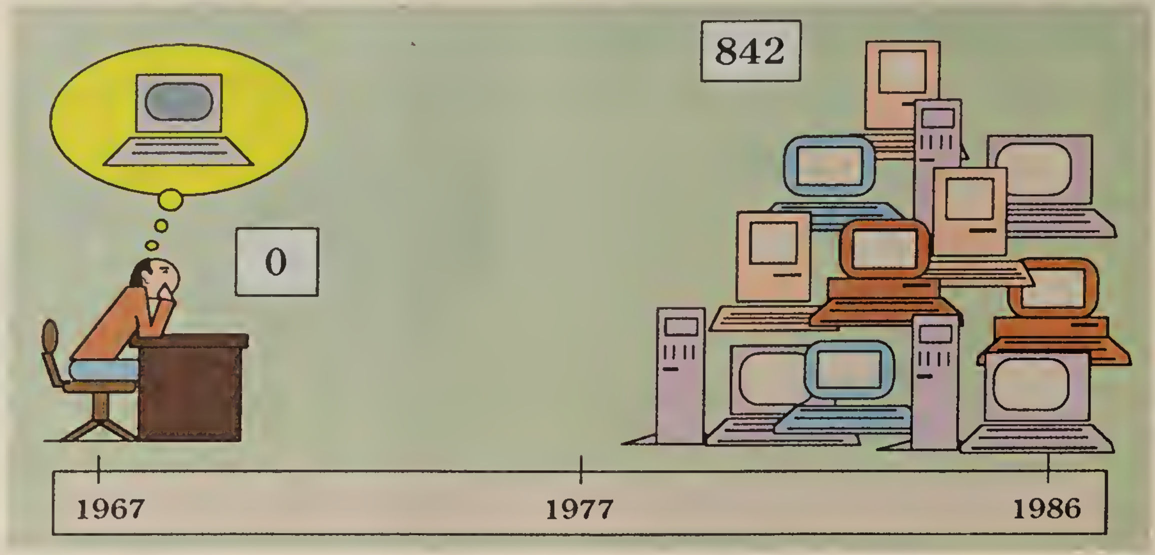
Relinquish the Vulcan grip

Yet these are precisely the characteristics of the broader world we now inhabit; initial uncertainty compounded by permanent indecision is the hallmark of modern systems. We will need to be able to enter a situation in which no one has a clear idea of what needs to be done, and instead of attempting to impose order, structure and discipline on a chaotic environment, we will have to go with the flow, providing direction even when the destination is not in sight or even identified.

We will also need to provide leadership for the corporation as a whole. MIS will be among the primary agents for innovation in the organization. Companies everywhere are struggling with the contradictory needs of drastically reducing costs and dramatically improving quality. It is only through the redemptive power of information technology that these objectives can achieved. It will be our job to understand our users' businesses so well that we can recognize their needs even before they do, show them what technology can do for them and lead them into exploiting it.

Traditionally, the highest praise sought by an information systems organization was that it was responsive to its users. While this was presumably better than being unresponsive, it is now far from sufficient. We will have to be proactive and aggressive. MIS must champion the innovations that systems will engender and steer these innovations through the rocky channels of implementation and acceptance. This will require aggressiveness, perseverance, political savvy and selling skills — traits not normally included in an IMS Internals curriculum.

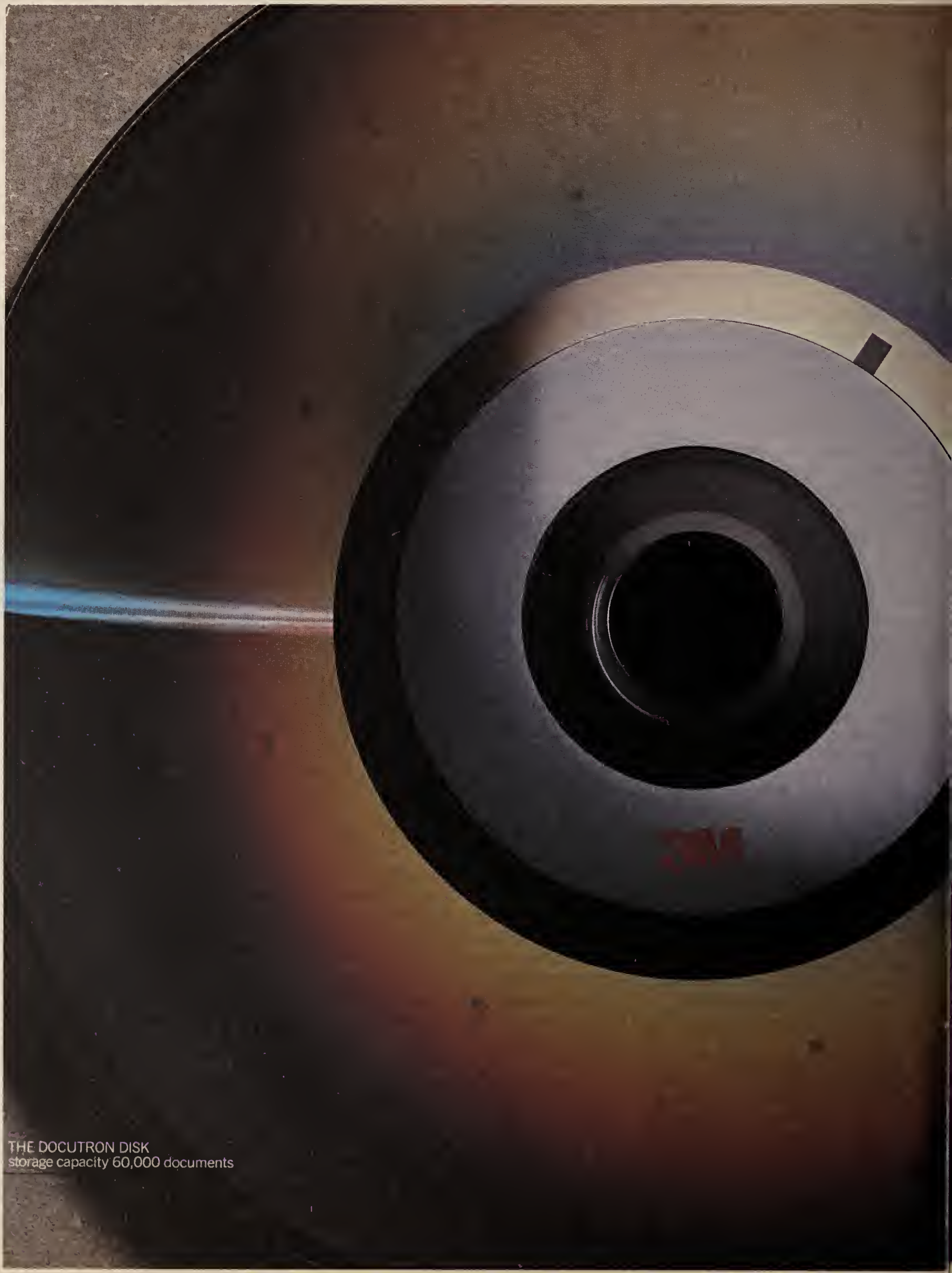
This is a tall order. Some might say it will require a personality transplant, others a lobotomy. But we have no choice. The Age of the High Wall is over, and we must brave the world that lies beyond it. If we do not, another oxymoron will describe us: "the living dead." But we should not be overly terrified of the uncertainties that lie ahead. W. Somerset Maugham wrote, "It is bad enough to know the past; it would be intolerable to know the future." Stick around; it won't be boring. •

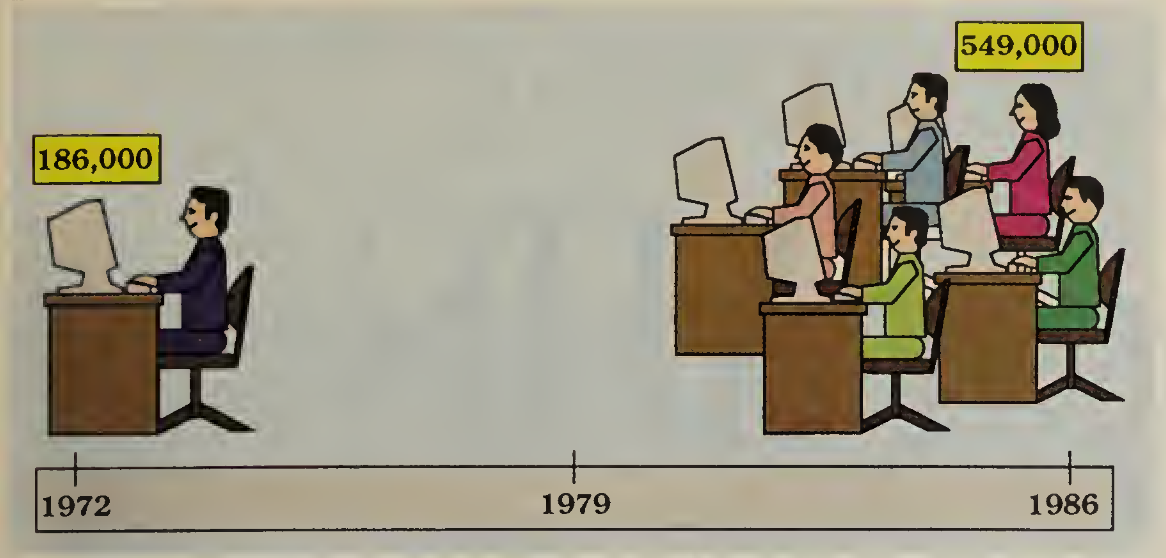


Installed personal computer models: Single-user systems

• The personal computer was not around in 1967, but in 1986 the MIS manager could choose among 842 unique systems

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: MITCHELL J. HAYES

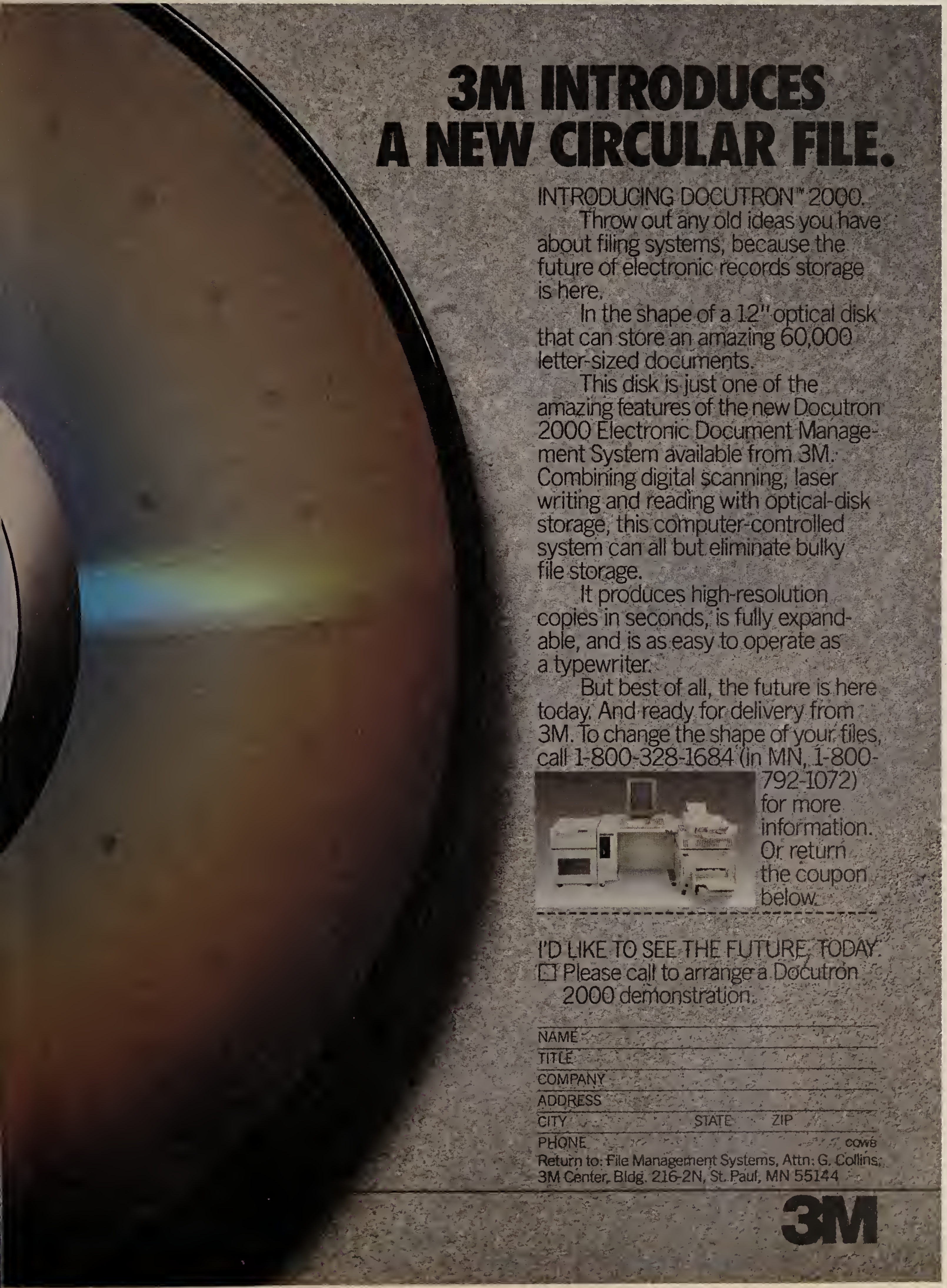

THE DOCUTRON DISK
storage capacity 60,000 documents



Programmers on the rise

• The demand for programmers, based on the number employed, has grown 195% since the census started counting computer occupations

INFORMATION PROVIDED BY THE U.S. BUREAU OF LABOR STATISTICS OFFICE OF ECONOMIC GROWTH AND EMPLOYMENT PROJECTIONS
CW ILLUSTRATION: SUSAN ALDAM


3M INTRODUCES A NEW CIRCULAR FILE.

INTRODUCING DOCUTRON™ 2000.

Throw out any old ideas you have about filing systems, because the future of electronic records storage is here.

In the shape of a 12" optical disk that can store an amazing 60,000 letter-sized documents.

This disk is just one of the amazing features of the new Docutron 2000 Electronic Document Management System available from 3M. Combining digital scanning, laser writing and reading with optical-disk storage, this computer-controlled system can all but eliminate bulky file storage.

It produces high-resolution copies in seconds, is fully expandable, and is as easy to operate as a typewriter.

But best of all, the future is here today. And ready for delivery from 3M. To change the shape of your files, call 1-800-328-1684 (in MN, 1-800-792-1072) for more information. Or return the coupon below.

I'D LIKE TO SEE THE FUTURE, TODAY.
☐ Please call to arrange a Docutron 2000 demonstration.

NAME
TITLE
COMPANY
ADDRESS
CITY STATE ZIP
PHONE COW8

Return to: File Management Systems, Attn: G. Collins,
3M Center, Bldg. 216-2N, St. Paul, MN 55144

3M

Flashbacks

JUNE 27, 1977

CONGRESS BLASTS FBI SWITCHING PLAN

A barrage of congressional criticism forces the Carter administration to withdraw its endorsement of the controversial message-switching system.

The system, proposed by the Federal Bureau of Investigation, would funnel National Crime Information Center-related administrative messages to and from the nation's local and state law enforcement units. Members of Congress blast the proposed system as the beginning of a "national police state."

AUGUST 29, 1977

DP CENTER BOMBINGS PLAGUE ITALY

Computers are "instruments of the capitalistic system" — and must be destroyed.

That dire message is the thread that links an unprecedented wave of political computer center bombings by the Unita Combattenti Communiste (Communist Combat Unit).

The bombings have been directed toward corporate and state computer installations in Italy during the past 10 months — a wave that has left in its wake more than $5 million in damages.

JANUARY 23, 1978

USERS AWARD XEROX, AMDAHL TOP GRADES IN SURVEY

Computer equipment from Xerox Corp. and Amdahl Corp. garner first and second place honors, respectively, in overall user satisfaction in Datapro Research Corp.'s survey of computer users.

What makes these results especially noteworthy is that Xerox no longer even makes or supports its computer systems, and Amdahl Corp. is a relative newcomer to the computer-equipment business.

BY ASHLEY GRAYSON AND JOHN VORNHOLT

The new MIS

As management learns more about DP, and vice versa, the traditional lines will blur, and MIS will be poised to play a larger role in corporate decision making

"To stay where you are, you must run as fast as you can. To go anywhere else, you must run faster yet." — The Red Queen to Alice in *Through the Looking Glass.*

Today's MIS director is a human relations expert, punching bag, technology wizard and highly visible manager in the upper ranks of most companies. And while it is still true that experience counts in MIS, these days the wisdom of the ancients is good for about three months. "Every time I think I understand my job, they introduce something new, and I start over," muses William Strowbridge, vice-president of management information resources at Dataproducts Corp., a printer manufacturer in Woodland Hills, Calif.

"Ten or 15 years ago, you could explain the problems you were having with punch cards or data files, and no one would understand. They'd walk away confused, mumbling," Strowbridge explains. "Today, you get a request from a user to change a simple report, and you talk in terms of six to eight weeks of a five-step systems-development methodology. He rolls his eyes back, walks out and does it himself."

Strowbridge says such initiative shown by users is probably healthy because it makes MIS more cost-competitive. But while it may be healthy, it is just one more thorn in an MIS manager's side. After all, controlling disparate systems within organizations is more difficult than managing old-style computer rooms, and managers today must keep track of and manage not only their central systems but also a myriad of micros, workstations, departmental systems and the communications net that connects them all.

In addition, the technologies on the market and the pressures from upper management are also quite different. In days past, says Gary Rinehart, manager of information technologies for San Diego Gas & Electric Co. (SDGE), "staying current in the data processing department often involved planning for the next generation of mainframes." But not so today, he says, when most of information services' work represents a fairly substantial hit on the bottom line.

MIS is much more likely today to have to justify their expenditures because upper management is more systems savvy. "Some look at information systems as a strategic weapon against the competition — others think it's a millstone around their necks," Rinehart says. "New mainframe technology comes under particular scrutiny because today's management is more comfortable with computing. They're asking, 'Why do we want to do things faster? How much is it costing?' "

But MIS pros are overcoming these management obstacles, and their jobs are reflecting a wider horizon than previously imagined.

Strowbridge, like many MIS professionals today, has responsibilities not always associated with data processing. "We've pulled a few other things into it," he says. "I have travel, telephones, the mail room, just about anything that moves information. We find a lot of synergy among all kinds of information, being able to see how it all fits together — even mail and facsimile. I think it gives us an ability to optimize our efforts."

Changes in SDGE's MIS structure reflect another DP group that has broadened its horizons. "The blending of data communications, telecommunications and the computer center is taking place constantly," Rinehart says. Three years ago, SDGE brought its telecommunications group into the information services group, and the relationship continues to grow closer. In fact, a planning group combining information systems and telecommunications personnel now exchanges information and plans regularly.

Microcomputers, almost 400 of them, are also a part of SDGE's total system support. While an

Continued on page 20th/18

MARK REINSTEIN/GAMMA LIAISON

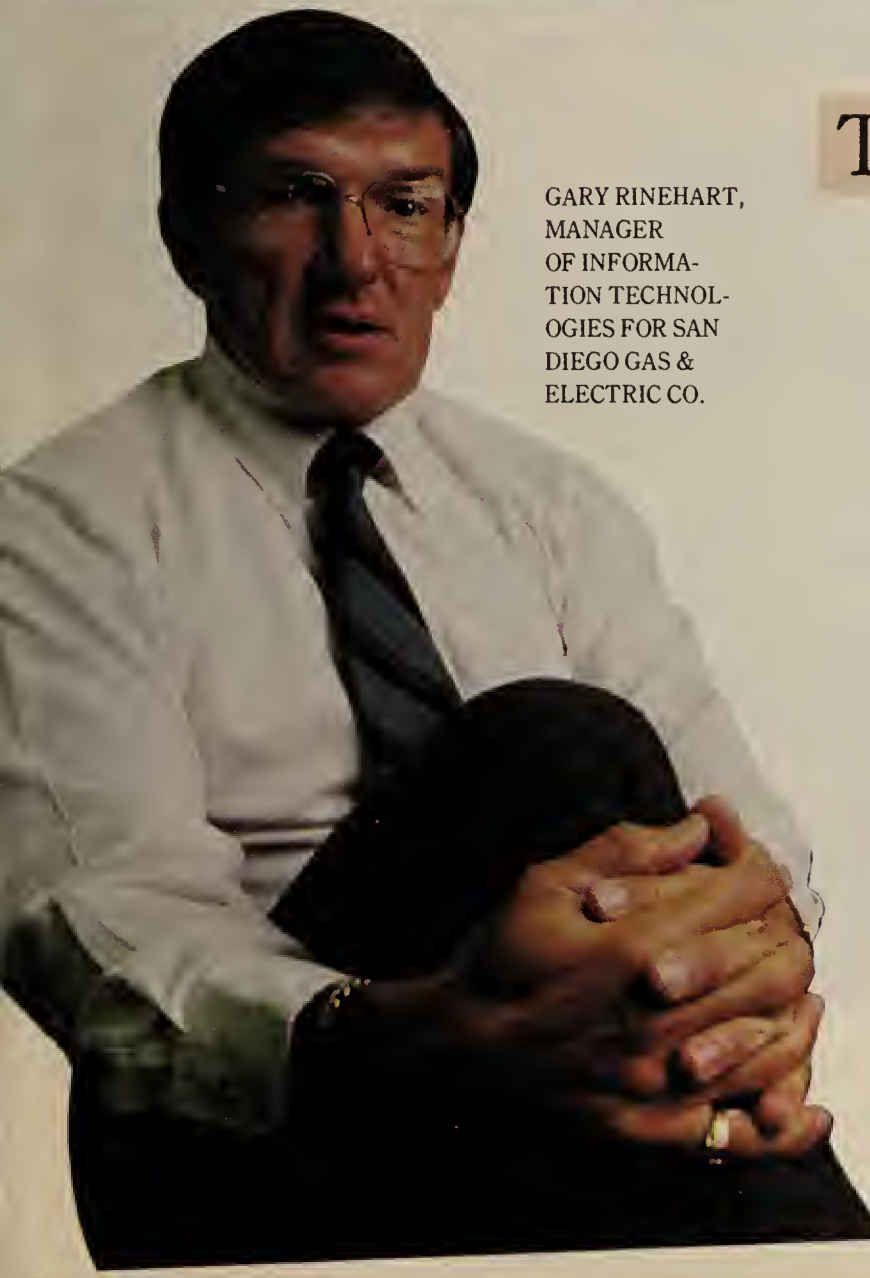
WALTER DULANEY, CORPORATE INFORMATION SERVICES, BALLY MANUFACTURING CORP.

Grayson is president and Vornholt is project manager at ADG, a San Pedro, Calif.-based literary agency.

If you give users the right tools, chances are they will do an outstanding job with them. The danger is that they can create islands of information, doing so in a vacuum.

WILLIAM STROWBRIDGE, VICE-PRESIDENT OF MANAGEMENT INFORMATION RESOURCES AT DATAPRODUCTS CORP.

ERIC SANDER/GAMMA LIAISON



GARY RINEHART, MANAGER OF INFORMATION TECHNOLOGIES FOR SAN DIEGO GAS & ELECTRIC CO.

ROBERT BURROUGHS/GAMMA LIAISON

TIMELINE: *Software*

1967

Cobol and RPG face stiff competition from a new computer language called Adpac, which claims to best Cobol by eliminating the Data Division and improve upon RPG by providing additional language elements.

1968

The U.S. Patent Office issues the first patent for a computer software program to Martin Goetz, vice-president of Applied Data Research.

Consultant John Cullinane founds Cullinane Corp., which introduces the $10,000 Culprit, a report writer for IBM mainframes.

1969

Rear Adm. Grace Murray Hopper is named the first recipient of the Data Processing Management Association's Computer Sciences Man-of-the-Year Award.

IBM unbundles applications software, languages and systems software, indirectly launching the independent software industry.

AT&T Bell Laboratories develops the Unix operating system.

1970

John Imlay rescues Management Science America from Chapter 11 proceedings and turns the company around in a year's time. MSA would later evolve into the largest applications software company in the world.

The Patent Appeals court broadens the criteria for patenting software to qualify computer

ILLUSTRATION BY CHRIS DEMAREST

Continued on page 20th/18

ACCESS
SNAPP

"We sell power equipment. And now we've got a powerful system to handle our information management needs. It's a secure feeling to know that your development tools are as good as the people you hire to use them."

Hexie McDonnold

Hexie McDonnold
Director of Data Processing
Snapper Power Equipment
A Subsidiary of FUQUA Industries, Inc.

IDMS/R.
ER DID.

Mowing down the competition in the outdoor power equipment business takes more than quality products. The efficiency of accessing information throughout the organization is what ultimately puts you on the cutting edge. That's why Snapper – a DOS shop – turned to Cullinet's IDMS/R.

By replacing their COBOL system with Cullinet's integrated relational architecture, Snapper has been able to maintain large databases and provide everyone instant access to information. And with ADS/OnLine – Cullinet's fourth-generation programming language – Snapper has been able to cut and trim applications development time and costs.

Cullinet's comprehensive information management technology is the root cause of some impressive Snapper results. A new bill of materials format, for example, now provides both engineering *and* production data with up-to-the-minute accuracy. IDMS/R has improved access to inventory, order status, current pricing, current costs, finished goods status and credit information.

Snapper's small staff has been able to develop large claim services – including group medical and co-op advertising, promotions and warranty service credits. And Snapper has found greener pastures in IDMS/R's automatic recovery feature that ensures availability of data.

For more information on how your company can access Cullinet through IDMS/R, call toll-free 1-800-551-4555. Or write to Cullinet Software, Inc., 400 Blue Hill Drive, Westwood, MA 02090-2198.

Cullinet

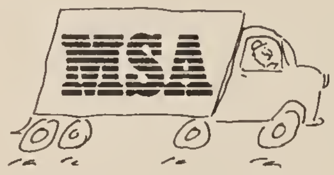
An Information Technology Integrator
For The 80s, 90s And Beyond.

From page 20th/15

programs that describe a method rather than just a process.

1971

Digital Equipment Corp. and Carnegie-Mellon University develop and implement Xcon, an expert system that configures VAX-11/780 computers on a daily basis for DEC.



Pascal, named after the famous French mathematician, is developed by Niklaus Wirth as a programming language for systems development.

1972

Nolan Bushnell, parlaying a $500 investment, launches Atari, Pong and the multi-million-dollar video game industry.

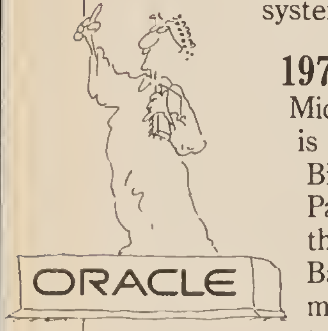
1973

Cullinane Corp. (later known as Cullinet Software, Inc.) introduces IDMS, a major data base management system product.

Software AG of North America is founded. Its first product is Adabas, a high-performance data base management system.

1974

The U.S. Court of Customs and Patent Appeals rules that a software system is patentable matter when it is claimed as an apparatus or a part of an overall system.



1975

Microsoft Corp. is founded by Bill Gates and Paul Allen after they adapt the Basic programming language to the Altair micro.

1976

SAS Institute releases Base Statistical Analysis System.

Gary Kildall and Dorothy McEuen form Digital Research to sell Kildall's CP/M operating system, which he was previously selling through a hectic mail-order business.

1978

John Barnaby creates Wordstar, which becomes a standard for microcomputer word processing.

Dan Bricklin and Bob Frankston create Visicalc, the first electronic spreadsheet software, marketed by Software Arts.

1979

The Department of Defense announces completion of the Ada language, designed for real-time scientific and systems applications.

1980

Cincom Systems' Total DBMS breaks the $100 million sales barrier, a first for a single program product.

Relational Software introduces the Oracle relational data base management system, launching a new breed of DBMS and adding "relational" DBMS to the list of buzzwords of the '80s.

Relational Technology, Inc. adds its offering to the relational DBMS fray — Ingres.

1981

IBM commissions Microsoft to design an operating system for its new PC, and MS-DOS is born.

Software marketing whiz George Tate sells Dbase II, a DBMS for 8-bit PCs developed by NASA engineer Wayne Ratliff.

Artificial Intelligence Corp. introduces the first commercial AI product — Intellect — a natural-language query, analysis and reporting tool.

1982

Mitch Kapor and Lotus Development Corp. introduce the $495 1-2-3 integrated software package for the new IBM PC 16-bit processor.

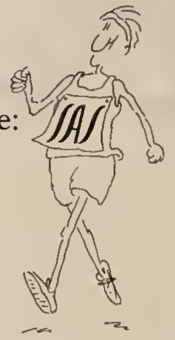
1983

Lotus's 1-2-3 takes Visicalc's place as the popular spreadsheet program.

Multimate International's Multimate word processing software bows, as does Microsoft Word for the IBM PC and compatibles.

Fourteen-year-old McCormack & Dodge introduces Millenium, the first applications development and execution environment offered by an application software vendor.

Affordable PC software takes the stage: Adam Osborne founds Paperback Software International, and Borland International introduces the $49.95 Turbo Pascal — a compiler and integrated programming environment for PCs.



1984

Despite all the fanfare, this year's generation of multifunction software — such as Lotus's Symphony and Ashton-Tate's Framework — gets a lukewarm reception.

1985

Ashton-Tate acquires Multimate and its tremendously popular Multimate word processing package.

Managers of software systems programming garner the highest salaries of all U.S. DP employees, with applications programming managers coming in second, according to an Administrative Management Society survey.

Aldus introduces its $495 Pagemaker page-layout software, heralding the beginning of the desktop publishing craze.

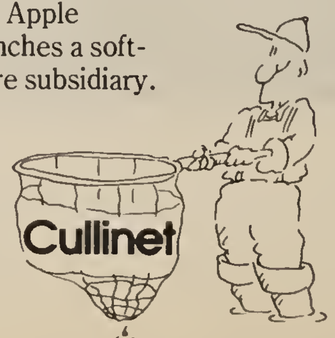
1986

Lotus founder Mitch Kapor resigns as chairman of the company.

1987

IBM announces its graphics-oriented operating system, OS/2. A month later, IBM signs a 10-year software marketing and development deal with Lotus to put 1-2-3 on mainframes.

In the same April week, John Cullinane announces plans to resign as chairman of Cullinet Software to pursue noncomputer-related interests, and Apple launches a software subsidiary.



ILLUSTRATIONS BY CHRIS DEMAREST

Continued from page 20th/15

information center provides basic support, traditional information service professionals are encouraged to play a role in PC support. Rinehart, a proponent of PCs in the work force, claims the DP professional is sometimes slow to accept the micro. "In order to take full advantage of the PC, you must have a team effort," he says. "Not only should the people within the information center be involved, but also the professional data processors who can assist their client base in using that machine."

MIS at SDGE is investigating how PCs might be effective in their environment. Specifically, they are looking at the PC as a workstation for program development and examining the place of two- and three-tier data processing in their shop.

PCs also have a strong presence at Dataproducts, and Strowbridge, like many MIS professionals, views them with a mixture of respect, awe and trepidation. The company attempts to guide microcomputer use without squashing the end user's creativity. Dataproducts' technical support staff evaluates micro products to create company standards. The users are then encouraged to work within those standards, applying their own talents.

"Instead of trying to control and discipline users, we take a very liberal, supportive role of micros and local-area nets," Strowbridge explains. "The user community is very creative and they know their jobs. If you give them the right tools, chances are they will do an outstanding job with them.

"The danger," he says, "is that users can create islands of information and do it in a vacuum. If it's not in concert with a strategic plan, it can get a company into serious trouble." Managing micros, Strowbridge says, is like walking a tightrope. "It should be encouraged if you set the proper boundaries and disciplines, but what you are looking for is a comfortable compromise between total freedom and total bureaucracy — like we've known with mainframes."

But what are those boundaries? For Strowbridge, they include "identifying the host-based applications that cannot be duplicated on a micro," and then allowing the mainframe data to be downloaded onto PCs for further analysis. Mainframe access at Dataproducts is formally controlled; how and when it can be allowed is planned between the PC users and the application project leaders.

For Ed Hodgson, manager of computing and communications at Westinghouse's Livingston Computer Center — a computing and communications services branch of Westinghouse Elevator Co. in Livingston, N.J. — the micro boundaries include "trying to get the users to plan with us and let us know what their intentions are. They can have a computer in two weeks, but if they want RS-232 communications, it may take us 30 days to get the line drivers in stock."

One way Westinghouse MIS management deals with end-user requests is through their information center, which answers many basic user requests. Technical problems are handed over to Hodgson's group.

But even with an information center, Hodgson, a 34-year MIS veteran, has found that easy-to-use micros are not necessarily easy to manage, especially since so many of those PCs are remote and their users demand to be networked and go on-line. "Micros pop up like weeds and are just as uncontrolled," Hodgson claims. "You don't really know there's one there until they say, 'I'm ready to communicate.' Helping a remote on-line user with a computer problem is often like telling a kid how to tie his shoes over the telephone."

But Hodgson is also quick to admit the need for such small systems. Micros are helping out in Westinghouse's field sales offices, where they are replacing older systems and, in fact, Hodgson admits even he uses one.

"Communications was a foreign world to the data processing community 20 years ago," Dataproducts' Strowbridge claims — but not so anymore. Communications technology is now intertwined in MIS systems, and networking jargon is integral to an MIS manager's vocabulary.

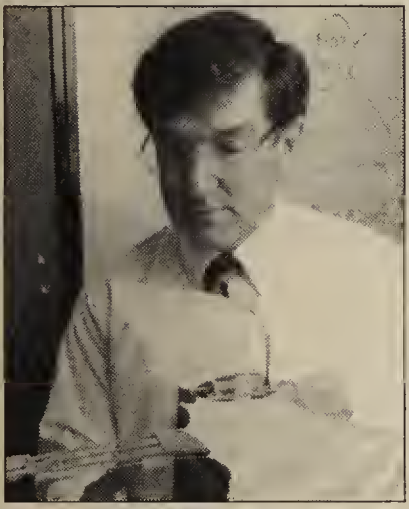
'Pseudo-networking'

At Bally Manufacturing Corp., a Chicago-based entertainment and recreation conglomerate, Walter DuLaney, director of corporate information services, combines local-area networks, a Digital Equipment Corp. Vaxcluster and PC packages to give users access to the micro software they want to use. "Pseudo-networking" is what DuLaney calls this hybrid of PCs and host computers, a combination that lets Bally's end users take advantage of "the tremendous amount of PC software — tax and accounting packages, treasury cash management systems and business support tools."

Bally uses microcomputers as workstations that can access the host — the Vaxcluster — while running PC software. Bally does legal reverse-engineering of PC software by analyzing the flow of data and routing it to mini disks that are set up on the Vaxcluster. In effect, DuLaney follows classic system analysis with PC files. His staff looks at a PC file in the host and defines it as shared, not shared, write update, read update and so on. All of this work is done on a file level, not on a record level, so the company achieves compliance on all software contracts.

Once the files are on the VAX, they have the same directory structures they would have on the average Disk C available on a hard disk. Because the remote disks are on a host, DuLaney's users have unlimited storage. Also, the PC files on the host can have the sharing characteristics found in a mainframe environment, including access protections and restrictions.

"We don't have hard disks in the PCs at all — we remove them. We just put the data out on the host. This allows people to share report files, master files and updates. The boss can stay in his office and review whatever he likes," DuLaney says. "We've taken the PC package that you buy for very little and have made it multiuser, at least for data. We're not interested in full networking, because that defeats the convenience of running PC software on a PC."


YVONNE HEMSEY

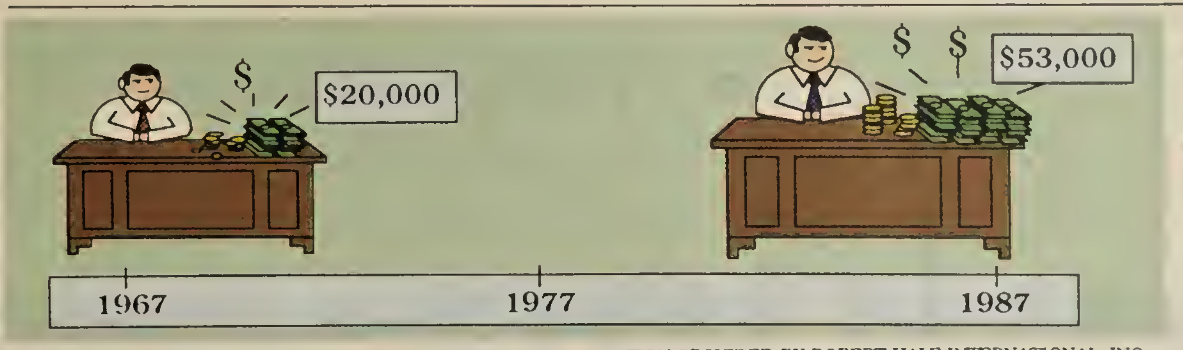
Gary Rinehart

DuLaney does not try to enforce software standards — the users acquire whatever they need. "The managers are intelligent enough to evaluate the functional merits of software," he says. "There's no way you can tell a professional not to buy a tool that fits the job."

Another vital part of the new MIS manager's responsibilities is the ability to communicate well with both systems staff and end users. "If you create an environment where data processing people understand the user's job, what he's trying to achieve, you can positively contribute to educating him in using the technology," Dataproducts' Strowbridge says.

DuLaney agrees. To make his PC/host network work, he and his staff had to gather user support. MIS has to be up front with users, he says, because the process of setting up such systems can be slow and somewhat painful, and users — as well as management — have to realize what is involved.

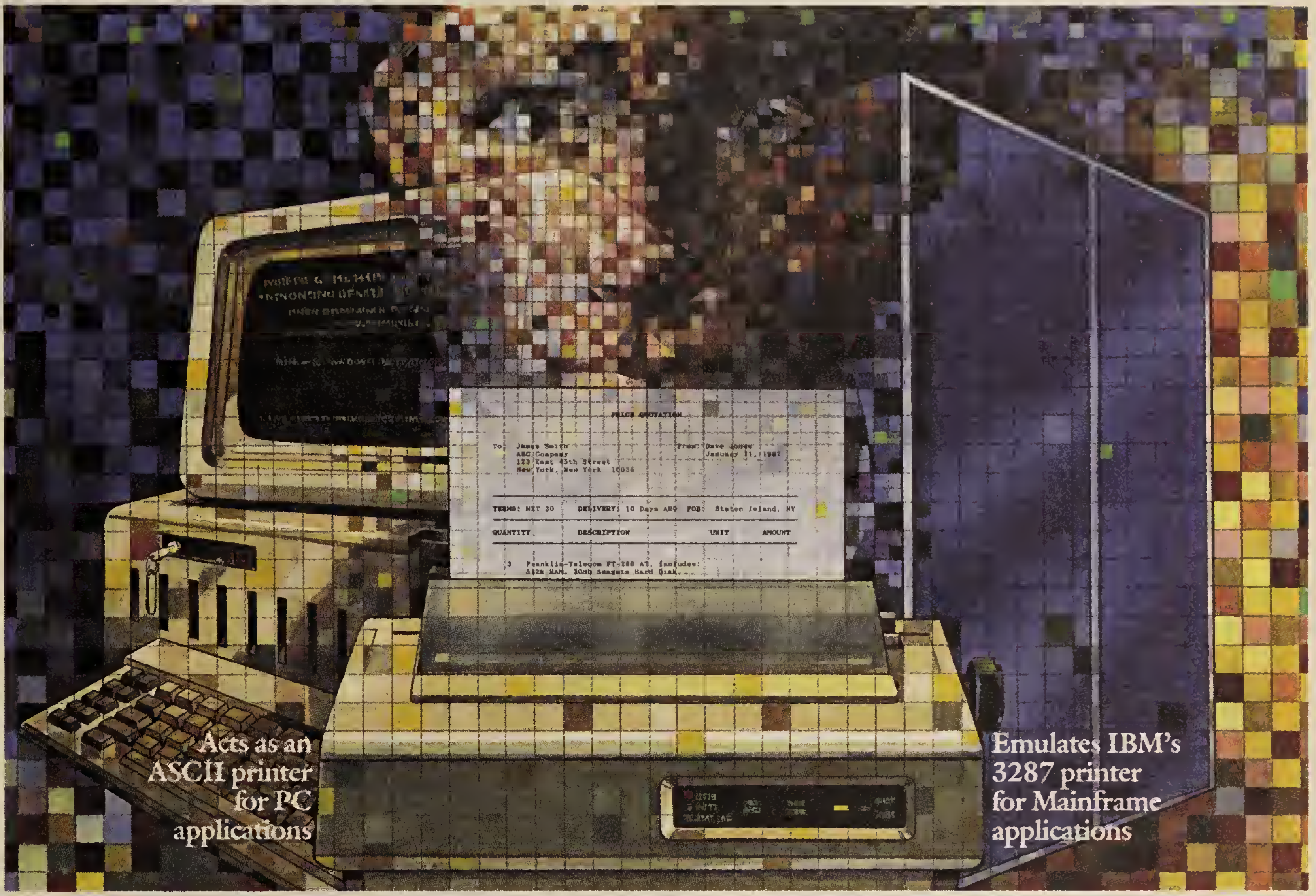
But as MIS learns more about management and management learns about MIS, the traditional lines will become blurred, SDGE's Rinehart says. "Management involves decision making, and MIS is poised to play a larger part in corporate decision making in the future." •



Average MIS manager starting salaries

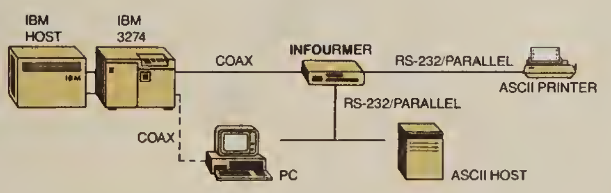
- The average salary for MIS managers has jumped 165% in the last 20 years

INFORMATION PROVIDED BY ROBERT HALF INTERNATIONAL, INC.
CW ILLUSTRATION: MITCHELL J. HAYES


Acts as an ASCII printer for PC applications
Emulates IBM's 3287 printer for Mainframe applications

GIVE YOUR ASCII PRINTER A SPLIT PERSONALITY.

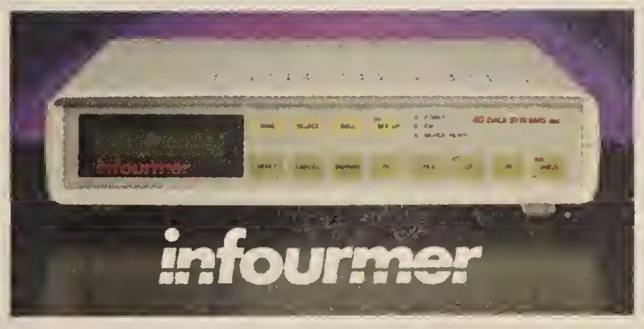
Meet the *Infourmer* from 4G Data Systems. It's a printer adapter with two important character traits. One, it attaches directly to IBM PCs for ASCII printer applications; and two, it emulates the IBM 3287 printer for mainframe applications.



Just think of the possibilities. Now you can access your company's IBM host, preview and work with the data on your desktop PC, and get your printout on any popular, low cost ASCII printer at any remote location. Conversely, you can network the IBM 3287 system without an expensive IBM 3287 printer. Or to put it simply, you can now integrate the same ASCII printer for both PC and IBM or ASCII host applications.

The big advantage of the Infourmer is that it makes more of your ASCII printer capability. Much more. You get more type fonts, faster print rates, higher quality, and quieter operation. And no more waiting for printouts from the basement computer room. You get your hard copy where and when you need it. All for about one fourth of what it costs for an IBM printer.

As specialists in micro-to-mainframe link communications, the Infourmer is precisely the kind of product you would expect from 4G Data Systems. It's our printer adapter with the split personality that brings it all together for you. For more information, call us toll-free **1-800-367-4539**. In New York, call **1-800-223-4539.**



4G DATA SYSTEMS inc

Infourmer is a trademark of 4G Data Systems, Inc.
© 1987 4G Data Systems, Inc.

PROFILE BY JEAN BOZMAN

Banking on DEC

Twenty years have brought

Bankers Trust's Stanley Rose

from bit pusher to worldwide DEC hardware manager

Twenty years ago, Stanley Rose was an MIT graduate learning to program one of Digital Equipment Corp.'s first minicomputers, a PDP-1. He had a degree in electrical engineering because computer science was not available as a degree when he went to school. At the same time, a small Massachusetts company named Digital Equipment, founded by other MIT graduates, was gaining a following in universities, research laboratories and hospitals as a small but capable scientific processor.

In the years since, Rose's career in computer administration has, in some unique ways, paralleled the growth in power of DEC's computers. In the late 1960s, Rose worked at Boston's Massachusetts General Hospital, programming DEC PDP-7s and PDP-8s. In the mid-1970s, he moved to a Wakefield, Mass., medical software house called Automated Health Systems, where he developed software programs for hospitals. In 1977, he moved into banking by joining Bankers Trust Co. in New York. Still, he kept working with DEC processors and increasingly with the new generation of VAX machines that gradually replaced DEC's PDP-11 series of minicomputers.

Today, at 42, Rose is a vice-president at Bankers Trust, one of the 10 largest banks in the U.S., with $58 billion in assets. Bankers Trust has operations all over the world, with major data centers in London, Hong Kong and Sydney, Australia. Each of these international data operations runs DEC computers, many of them high-end VAXs. They form the backbone of a worldwide Bankers Trust data network that handles as much as $100 billion in transactions per day.

Rose leads the Distributed Processing Technical Support group, which manages nearly 100 VAX machines, ranging from the high-end VAX 8700s to the low-end Microvax II. The computer rooms in the bank's New York headquarters hold one of the largest commercial configurations of DEC machines anywhere, and Rose was more than happy to provide a quick tour of those computers recently. Altogether, Rose estimates that Bankers Trust has more than 100 million instructions per second's (MIPS) worth of VAX equipment, which is nearly equal to the number of MIPS provided by the bank's four IBM 3090 mainframes.

As part of its responsibility, Rose's technical support group handles all DEC hardware purchases for the bank's international data network. It also provides support to the bank's many end-user organizations and coordinates requests for vendor maintenance. The group is the prime focus of all Bankers Trust's interactions with DEC, Rose says, and acts as the principal negotiator for all DEC equipment and software coming into the company.

PHOTOS BY YVONNE HEMSEY/GAMMA LIAISON

ROSE, OVERSEER OF ABOUT 100 MIPS' WORTH OF VAX EQUIPMENT, SAYS FEW FORESAW DEC'S PRESENT SIZE TWO DECADES AGO.

Whether dealing with hardware or software products, Rose is thoroughly familiar with the DEC product line. To keep current, he takes trips — often monthly — to DEC's home base near Boston. Among his frequent stops are DEC's facilities in Merrimack, N.H., and Littleton, Mass., where DEC engineers design the VAX machines and communications products.

Currently planning a more extensive journey — an around-the-world tour of the bank's data centers — Rose looks back on the ways in which the growing power of DEC machines has enabled Bankers Trust to expand its business both here and abroad. There are dozens of DEC VAXs in the lower Manhattan offices of One Bankers Trust Plaza, where Rose works. There are dozens more across the Hudson River in Jersey City, N.J., within sight of Rose's corner office, which also overlooks New York Harbor and the Statue of Liberty. The New Jersey machines are connected by T1 cables.

There are even more computers scattered around the globe, which are also part of the Bankers Trust system. They are connected by long-distance lines and by satellite links. Today, DEC is able to support and service Bankers Trust's far-flung computers and to fill the role of international vendor on a par with IBM, Rose says. But looking back 20 years, that outcome would have seemed highly unlikely. "I don't think anybody had any inkling that DEC would become that large," Rose says. "That's because no one knew how powerful a small machine could become."

Those small machines were the PDP-11s. They were interactive, bus-based systems that were built up in a modular fashion. If more capacity was needed, more PDP-11s could be carted in and linked together.

"A programmer of the early PDP machines," Rose says, "had to be an excellent bit pusher. He had to be able to know the hardware inside and out, to know where the data was, to be able to manipulate data registers and device drivers." That is because programs were written then in machine language or recompiled from a set of basic instructions. The concept of fourth-generation languages, with their layers of built-in code generators, was still many years away.

Rose admits to being one of those bit pushers in the late 1960s and early 1970s. "You didn't study computer languages back then, you studied techniques," he explains. "You wrote in assembler, and you

---

Bozman is *Computerworld's* Chicago-based Midwest correspondent.

To use Grace Hopper's analogy on systems clustering, when a farmer needs more ox power to plow his field, he doesn't get a bigger ox, he gets another one. Then he puts the oxen in parallel.

wrote compilers." And sometimes, Rose adds, you had to be a bit of a mechanic. "There were plenty of times in the old days when I would have to get on my back and pull out a module from the PDP-11. Today, you couldn't do something like that. The static electricity on your hand could zap the whole machine."

But if PDP-11s were modular, they were also quite small by today's standards. Memory was much more expensive then, and machines were shipped with 512K bytes or less. Terminal support from each PDP-11 was often 32 ports at maximum. "In order to increase your capacity in absolute numbers, you had to buy a lot of systems," Rose says. That was the case until the power of the VAX architecture changed DEC's presence in the computer room.

The first large-volume shipments of the VAX-11/780 came in the spring of 1978. The 11/780's 1-MIPS capacity changed everything about managing a DEC shop, and Bankers Trust's was no exception. The addition of VAXs meant that raw computer horsepower suddenly began to take off, boosting the capacity of the bank's DEC-based international trading system. Today, high-end VAX 8700s run at about 6 MIPS.

Overall computer capacity in DEC machines has quadrupled since 1984. And in VAXs alone, capacity has increased by a factor of six in the last three years. But even as new VAXs are added, Rose says, the older DEC machines are still running their original applications. He displays with pride one group of older PDP-11/70s that are still running a 1976 application alongside their RP06 series disk drives. These machines drive a money transfer system — the very first application of DEC technology at Bankers Trust.

"Everybody thinks that they'll bring in a new machine first and get rid of the old one later," Rose says. "But because the older DEC equipment is not obsolete, we still find uses for the older machines. I don't think we've released more than one VAX-11/780 since we've brought the newer VAXs on-line."

DEC's strategy of maintaining a single VAX operating system, DEC VMS, has meant that Bankers Trust is able to cluster the older VAX-11/750s and 11/780s alongside the high-end VAX 8600s and 8700s. "Our biggest cluster is made up of eight processors, all running VMS 4.5," Rose says. The machines include a VAX 8700, 8600, 8500, 8200 and a VAX-11/750.

In the future, Rose maintains, such clustering will become the preferred way of managing multiple computing resources. To explain, he describes an analogy used by retired Rear Adm. Grace Murray Hopper, a pioneer in compilers and programming during World War II who is now a consultant for DEC in Washington, D.C. "To use her analogy, when a farmer needs more ox power to plow his field, he doesn't get a bigger ox," he says, "he gets another one. Then he puts the oxen in parallel.

"We can't keep building machines bigger and bigger, because you begin to run into very real limitations, such as the speed of light," Rose explains. "What DEC has done is to provide clustering as well as peer-to-peer networking through Decnet, so that the network doesn't need to have one boss."

In many IBM networks, the high-end IBM 3090 mainframe is the boss, surrounded by several IBM 3725 front-end processors that manage an overall IBM Systems Network Architecture data network. The kind of side-by-side computing used in the Vaxcluster is simply not possible in most of the IBM world.

VAX clustering may be an advanced networking concept, but it is also a balancing act. Bankers Trust operations managers know that they need to keep operating system software current on all clustered machines. "DEC tells you that you must run the same release of VMS on all machines, with the possible exception of an upgraded machine," Rose says. "But we have learned that you cannot run a release that's more than one version away from the other copy of VMS." Otherwise, an application that runs smoothly on one machine may run into trouble on another.

The area of applications software is another that has seen great changes since the late 1960s, Rose says. In his days at Mass General, Rose worked on refining DEC's own MUMPS language for hospital and laboratory word processing applications. "At that point, people weren't even beginning to address the standards issue,"

Continued on page 20th/23

Flashbacks

NOVEMBER 6, 1978

DONALD DUCK CLEANS UP IN HUD AUDIT

It is an affair like no other — the "Walt Disney Affair" — in which the Department of Housing and Urban Development's IBM 7074 issues Donald Duck a $99,900 paycheck.

The General Accounting Office was investigating possible abuses in federal overtime pay when it purposely added Donald and 29 other cartoon characters' names to the HUD payroll as part of an audit check.

FEBRUARY 26, 1979

COMMANDO-TYPE RAID FREES TWO HELD IN IRAN

Two employees of Electronic Data Systems Corp. (EDS) held hostage by the Iranian government are freed in a commando-style raid organized and financed by EDS Chairman H. Ross Perot and led by U.S. Army Green Beret Col. Arthur (Bull) Simons.

Iran seized the EDS employees in an effort to force the facilities management firm to return to the Middle East.

NOVEMBER 19, 1979

NORAD SYSTEM GOOFS, CALLS ALERT

The North American Air Defense Command (Norad) launches a secret investigation to determine what went awry when its experimental computer system mistook a simulated missile attack for the real thing.

Norad swears its technicians are not at fault and instead blames its Honeywell, Inc. 427M top secret computer.

JANUARY 21, 1980

DP CUTOFF TO SQUEEZE SOVIETS

By cutting off high-technology exports to the Soviet Union, President Carter crimps Soviet plans to deploy data processing capabilities on a widespread basis in Soviet society, according to a Central Intelligence Agency report.

JULY 14, 1980

AMDAHL, NASCO TOPS IN IBM's RATINGS

Documents produced in the *U.S.* v. *IBM* antitrust trial reveal that IBM considers large-scale systems from competitors Amdahl Corp. and National Advanced Systems Corp. superior to its own.

Flashbacks

FEBRUARY 23, 1981

COMPUTERS TO FUEL SHUTTLE LIFT-OFF

Plagued by numerous minor failures as well as malfunctions in its army of computer systems, the space shuttle *Columbia* is set to lift off in April.

APRIL 20, 1981

ACLU SLAMS REAGAN'S DATA BANK PLAN

The American Civil Liberties Union assails a Reagan administration plan to ferret out welfare fraud by creating a computerized national data bank to list the identities of 25 million Americans who are listed as receiving public assistance.

JANUARY 18, 1982

U.S. v. *IBM* RESTS, ALSO SETTLES WITH AT&T

Two major legal battles between the government and the high-tech industry come to an end.

After 13 years and nearly 5,500 pages of transcripts, the Justice Department drops its landmark antitrust suit against IBM.

The U.S. also settles its 7-year-old antitrust suit against AT&T, transforming Bell from a telephone company to an information company.

The agreement requires Bell to divest its 22 wholly owned subsidiaries.

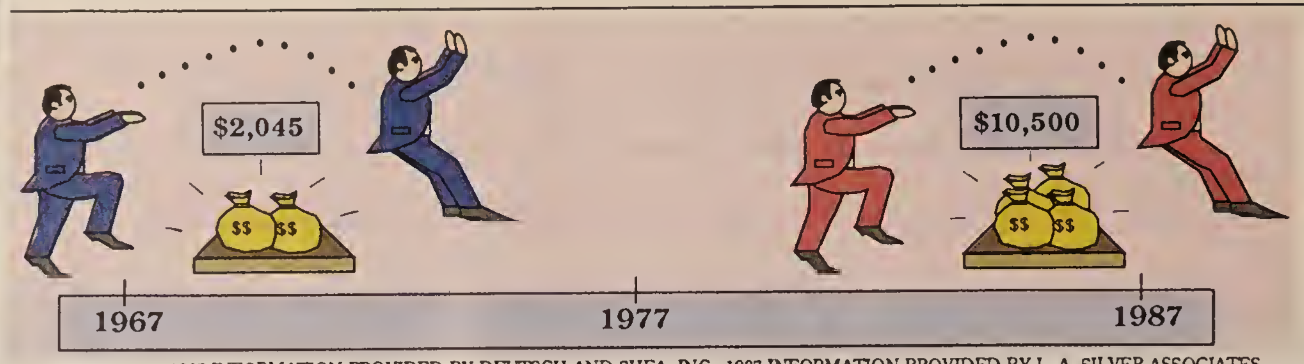
Wake Up Pocket Nets Now a Reality

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Judge Rules DPers Open to Malpractice Claims

Fears of FBI Switch Plan Grow



1967 INFORMATION PROVIDED BY DEUTSCH AND SHEA, INC., 1987 INFORMATION PROVIDED BY L. A. SILVER ASSOCIATES
CW ILLUSRATION: MITCHELL J. HAYES

Average cost per relocation of DP professionals

- The average company spends 413% more to relocate a data processing professional today than it did in 1967

Max Headroom for president in year 2000

By Philippe Kahn
President
Borland International

I won't be writing anecdotes — and you won't be reading *Computerworld* — in the year 2000.

There won't be anything like the term "computing" found in the human psychabulary: Vocabulary will have gone the way of other primitive forms of communication. Oh, there will be some kind of machine in existence that will have evolved from the ancient PS/2 and Macintosh II computers. They'll be the drones of civilization.

Society will focus on play. Max Headroom will be the supreme monarch, and we'll see him on the big screen in the sky. Max will have struck a deal with IDG Communications to distribute an editorial caplet — take one a day to keep up with the latest advances in technology.

We'll be battling it out with nasty competitors from Planet Zorg who oppose the new mindware standards set forth by the Committee on Brain-Damaged Machines. And Timothy Leary will have established a multibillion-dollar software empire based on intelligent artifice and led by an electronic board of directors from a galaxy called Armonk. •

Two decades old, computer systems may have only just begun

By Ralph E. Gomory
Senior vice-president
and chief scientist
IBM

Despite the extraordinary progress we have seen through the years in information technology, today's computing machines are merely the beginning of a future that promises a steady stream of advancements.

Just as today's desktop workstations are as powerful as the largest computers of 15 years ago, by the year 2000 workstations will exist that are comparable in capability to today's largest mainframes.

For example, even what I call an "electronic book" — a book-size object with a flat touch-sensitive screen, a marker for writing on it and storage for the equivalent of 300 novels — is well within the range of what the technology can provide in this time frame.

From small to smaller

The computer industry is fundamentally different from most other industries. All we do is deal with marks, or bits, if you like, and the only limit is how small we can make these marks and still read them. Since 1970, we have come from storing 1,000 bits on a field-effect transistor memory chip to one million bits, and we may well be close to another factor-of-1,000 improvement by the turn of the century.

This continued progress in the miniaturization that has driven and will continue to drive our industry will require ever deeper understanding of materials, increasingly elaborate processing tools and large investments in facilities.

To users, the resulting profusion of "cheap MIPS" will mean advances like the following:

- Workstations that accept more natural inputs, like handwriting and speech, replace text and symbolic outputs with realistic displays of the end result and provide an open window into all the capabilities of the system.
- High-end data complexes of parallel processors will make generally available 1,000 million instructions per second and 1,000 million floating-point operations per second simultaneously.
- Networks that integrate data and voice, exploit the synergy between workstations, minicomputers and mainframes by assigning each the task it does best and benefit from increasing attention to cross-systems consistency.

A tremendous software evolution is required to make all this computing complexity invisible to users, who will continue to see on their screens the local environment but will not know or care whether the file they request comes from down the hall or from six data centers across the continent. •

A peek at what next century heralds in software capability

By John Imlay
President
Management Science
America, Inc.

In the year 2000, our industry will have progressed geometrically in both hardware and software technology. Software will allow virtually instant access of unlimited data bases anywhere in the world. Instantaneous communications, artificial intelligence and voice/touch terminals will give users power to develop systems by conversation.

Electronic libraries of precoded modules will be accessed by voice command in building sixth-generation software. The human role will be to make decisions, show judgment, communicate and assert values in the creation of an application.

The machine will select code, logically link program modules and ask the programmer for decisions as the program builds. New code will be generated where necessary, and the machine will test and correct itself as the computer-aided software engineering program becomes paramount in the instant development of competitive computer software systems.

Standards and niches

The industry structure will consist of two types of companies. First will be large software companies ($2 billion to $3 billion), organized to serve industry segments by providing prepackaged applications and services by customer sector. By the year 2000, these companies and their products will become industry applications standards.

The second type of corporation ($50 million to $200 million) will be composed of specialized niche companies that provide state-of-the-art software within an industry segment.

New technologies such as holography will allow three-dimensional images to be produced without screens for examination by engineers, and these suspended images may be changed in size and shape by sophisticated software techniques combining lasers and computers.

Systems software as we know it will virtually disappear. Operating systems, librarians and data base management systems all will become firmware and part of the machine itself, since chips will cost less than disks, and programs and program storage will be stored in operating memory for instant access.

Because of this software revolution, industry segments will change the way they do business. Industries such as finance, insurance and investment banking will become one industry, and manufacturing will be revolutionized through robotics.

The challenge for all of us in the computer world is to remember that within this age of thinking machines and video images of each other, we must maintain daily person-to-person relationships. In spite of rapidly changing technologies, people are ultimately the key to the success of the information age. •

A few words for future MIS to live by

By Frederick A. Wang
President and treasurer
Wang Laboratories, Inc.

The integration of the four forms of information — text, data, image and voice — will be the single most powerful achievement during the next two decades. Studies we and others have done of Fortune 500 companies show that 100% of MIS money and time is currently spent on information that can only be captured electronically. Studies further show that this represents only 5% of information needed by corporate and legislative America — the remaining 95% is still paper-based.

In the next 20 years, the function of the much-touted chief information officer will crystallize. CIOs will be as familiar with the manipulation and management of image and voice then as they are with text and data today. They will aim to provide users with access to information in all its forms.

The best of these professionals will achieve this aim while, at the same time, hiding the

Continued on page 20th/23

True confessions of a software program in the year 2000

By Nicholas Zvegintzov
Editor
Software Maintenance News

I made my programmer cry tonight. She has been my programmer since I was a tiny kludge on the edge of the system. In those days, she was feisty and skittish, and she was going to get rid of me.

She surely tried! A lot of what you see around here are her attempts. Those specks on the counter? They're what resulted from when she tried to rewrite me in a language she learned in college; there's nothing left but the specks.

Then she tried to convert me. Bless my soul, I went to church! Outside, I was as structured as an angel; inside, I was just the same old devil spaghetti.

Once, she started an end-user park. She made pretty harnesses and hung screens and windows on a buggy and offered folks a ride, but it didn't work. Between harness and buggy, they still faced my big old back end.

Through the years, my programmer and I seemed to have exchanged roles. I'm a big kludge near the center of the system now. She's the one near the edge. Over the years, the proposals and the designs became fewer and fewer and then stopped altogether. Nowadays, she comes to work in her old soft shoes and doesn't bother to change into those pretty blue pumps. But we love each other still.

She still brings frisky little queries to share my stall. She runs my utilities twice a day and collects my garbage. She feeds me turboats on Pascal's birthday, and once she even let me watch an Ada Lovelace video!

For the last six months, we have worked together on changing the clocks so that the new millenium would come up correctly. When the ball fell in Times Square, it all went off, well, like clockwork. We put the subroutines to bed and took a byte together. I felt good, and I wanted to say something to make her to feel good, too. Instead, I made her cry.

The moment I spoke I could have bitten my buffer. It is well said that for a person and a program to love each other is to break two hearts. Humans have so little time to live and love and learn. What I said was: "Our work won't be wasted! We'll do it all again in the year 3000." •

Continued from page 20th/22

mystery of the technology from the user. Powerful desktop devices using voice recognition and interactive video will help mask the complexity of human-machine interactions. Artificial intelligence will also come of age, allowing machines to program, repair and manage other machines.

The vision of integrating the four forms of information is a straightforward one: Information shared becomes knowledge. The successful MIS professionals working toward the year 2001 and beyond need to embrace that vision, prepare strategic plans to implement it, take the necessary risks — experimenting with leading-edge technology — and remember end users' needs for simple, easy, workable solutions to their business problems. •

Continued from 20th/21

Rose recalls. "Back then, we at Massachusetts General were asking Digital to pick MUMPS up as a supported language."

Today, he says, the focus is on building systems, not on inventing them. "Our work has shifted from bit-pushing to the packaging of products," Rose says. "We want to make those products available for applications."

Those applications are written by specialists in the bank's various business center programming groups. Rose's technical support organization serves as a resource to those programming groups, advising them on additions to their computing resources or helping to diagnose software problems.

Bankers Trust bases its applications on off-the-shelf systems solutions provided by IBM and by DEC. The intent is to focus all of the bank's programming resources on applications specific to the bank's work. One advantage of this strategy is that systems are more easily maintained by DEC and by Bankers Trust staff members worldwide.

YVONNE HEMSEY

Stanley Rose

"Our goal is to stick with a vendor-supplied product," Rose explains, "unless there is a reason to go outside of it. You can always find a third-party product that fits some niche better than some other product. But if you look over the long haul and at how every piece of hardware and software has to be integrated, then you're better off going with a single-vendor solution from IBM or DEC." By relying on both major international vendors, Bankers Trust is also ensuring some measure of fail-safe redundancy in its systems designs.

If building proprietary hardware systems and operating systems is not the

Continued on 20th/24

NETSERV'S

SUPERSESSION™ WINS BATTLE FOR VTAM MULTI-SESSION SUPREMACY!

In a bold move to establish the clear superiority of NETSERV's SUPERSESSION Multi-Session Terminal Manager over a leading competitor, a head-to-head test and evaluation was waged at one of the competitor's customer's sites. From the start SUPERSESSION asserted its dominance. . .

SUPERSESSION used approximately 23% less CPU cycles per transaction and required 30% less working storage than the competitor. . .

SUPERSESSION handled 100, 200, 300, 400, 500 physical terminals with ease, with 2000 virtual sessions in a single region, while the competitor, even with 31 bit addressing, was not able to support even 100 physical terminals with four sessions each!

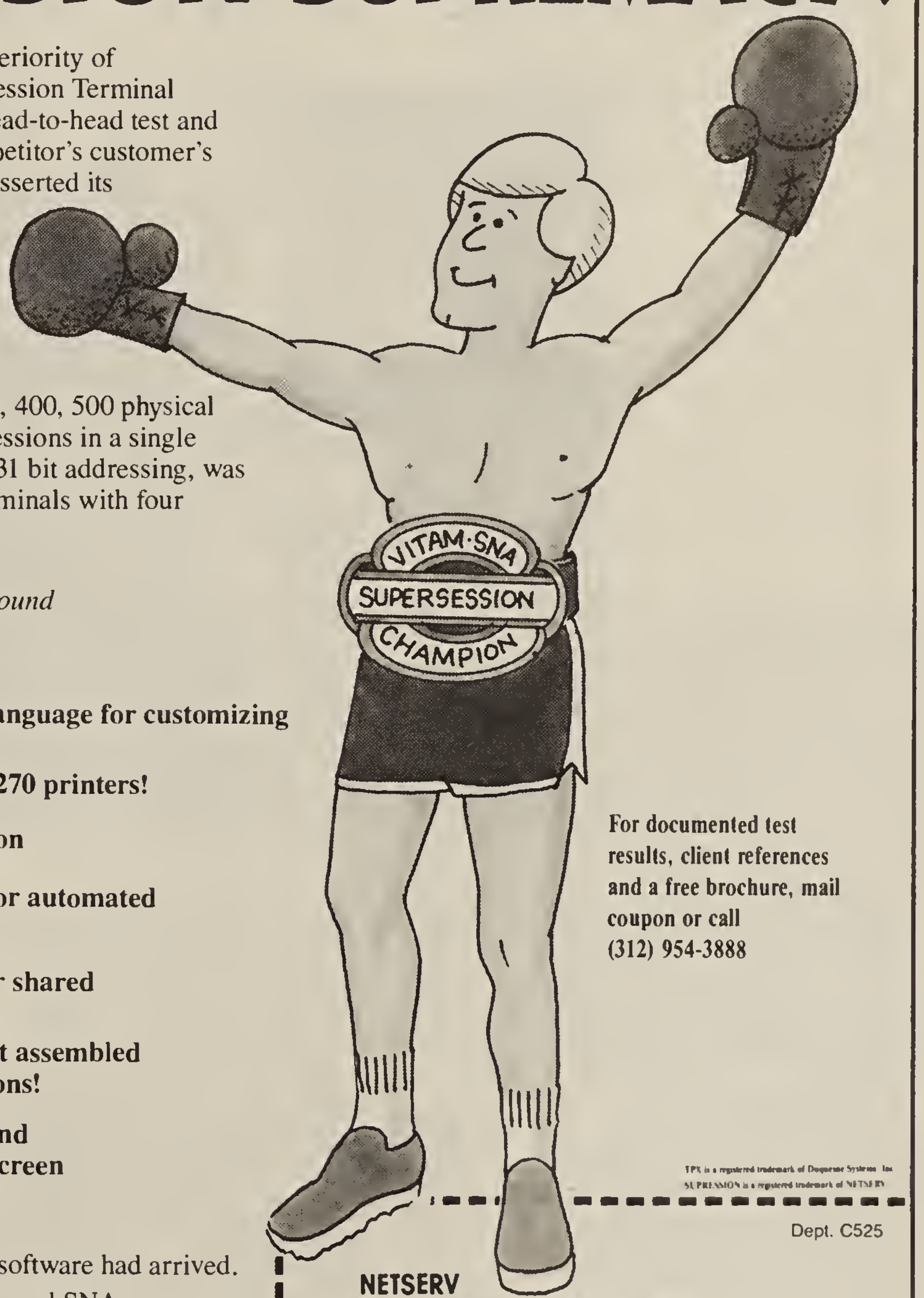
SUPERSESSION began the evaluation round with another relentless barrage:

- POW! **Vastly superior procedure language for customizing all system functions!**
- POW! **Multi-session support for 3270 printers!**
- POW! **Screen print from any session**
- POW! **3270 buffer manipulation for automated multi-session data entry**
- POW! **IMS/DC session services for shared terminal connections**
- POW! **Easy administration without assembled tables and terminal definitions!**
- POW! **Dynamic reconfiguration and monitoring through a full screen operator interface**

Clearly, the end of an era was at hand.
The second generation of multi-session software had arrived.

Our users include many of the most advanced SNA installations in North America. Join our winning team today!

NETSERV
The VTAM Networking Specialist
823 Commerce Drive • Oak Brook, IL 60521



For documented test results, client references and a free brochure, mail coupon or call (312) 954-3888

TPX is a registered trademark of Duquesne Systems Inc.
SUPERSESSION is a registered trademark of NETSERV

Dept. C525

NETSERV
823 Commerce Dr. Oak Brook, IL 60521

Please rush me free SUPERSESSION/HOSTGATE PLUS brochure.

☐ **Also send facts on IMSGATE, the cost-effective solution to IMS/DC dial-in access.**

Name ________
Company ________
Address ________
City/State/Zip ________
Phone ________

Continued from page 20th/23

goal at Bankers Trust, then creating an overall network architecture is. "The emphasis at Bankers Trust is on networking," Rose says. "We're building applications that are distributed across the world. Decnet gives us the power and capability to do this, since the software is transparent."

One thing that is not transparent, though, is the noticeable delay in signals caused by transmitting data over such great distances. End users can generally live with delay times of a second or more, but those can be cut down by increasing the amount of local hardware in the international data centers. "We already have small systems groups in each data center," Rose explains, "and they handle all daily support." However, central network support is coordinated from Bankers Trust's New York offices, he adds.

The principle of having a large amount of computer resources in the same place means that Rose can get the maximum leverage out of his staff of 25. "That way," he says, "a small group of people can service a great many computers."

Serviced by this small group, Bankers Trust's worldwide network works around the clock. Once, international loans could be handled over a period of days without fear that the competition would be able to do the same job faster. "Now, we have a financial position that's being drawn upon from multiple locations," Rose says. London supports the bank's financial activities in France and Germany, while Hong Kong relays information from Singapore, Tokyo and Seoul, South Korea.

Today, transactions have to be accomplished in seconds in order for Bankers Trust to be truly competitive with other world banks, and the bank's on-line network allows the work to cross time zones. "As the sun sets here," Rose explains, looking out his window at the New York twilight, "we pass the books over to the Far East. And, as the sun sets in Hong Kong, they pass the books to London."

Several weeks after this conversation, Rose was set to begin his three-week tour of Bankers Trust data centers in Europe and the Far East. It is a long way and a long time from the days when Stanley Rose could check out all his machines by simply walking down the hall. •

A CHARTER SUBSCRIBER LOOKS BACK

BILL SCEARCE

Bill Scearce, manager of customer services at New Albany, Ind.-based Key Communications Service, Inc., picked up his first *Computerworld* at the Data Processing Management Association's Boston conference in 1967. It happened to be CW's first issue. Still a subscriber 20 years later, he recently spoke with Senior Editor Janet Fiderio.

Did you think 20 years ago that you would still be in MIS and still be reading *Computerworld* today?

The idea never crossed my mind 20 years ago. It's been a very pleasant surprise.

How did you get involved in MIS?

In 1967, I was a programmer for Meidinger and Associates, a pension-consulting firm. I started as a programmer and just evolved into the user side.

What type of hardware were you working on in 1967?

It was an IBM 1130 punch card machine. It had one disk cartridge on it. The memory was relatively small by today's standards. I believe it was 16K. We stored our programs on the disk drive sometimes. Other times we fed them in with a deck of punch cards. Most of the data was input by punch cards. Now you store everything in magnetic form. It's just so much more sortable.

What was the physical environment like then?

We had the computer and all related equipment in one big office room. No special air-conditioning, no raised floor. By and large, there was no computer operator — we each ran our own jobs through the machine. We all stood in line and waited, one job at a time.

How have user requests changed in the service industry?

In 1967, users were afraid of the word "computer." Now they may not be programmers, but they understand the concept. Everybody, every elementary school kid now, has probably had some kind of experience with a computer. Some of the older adults may still be where they were 20 years ago. But the kids today, who will be the business leaders of tomorrow, all have that background. They are not afraid of the computer.

Is there anything you miss about the old systems or the old MIS?

No. I do not want to go back to the "good old days." I'll take the current days any time. The problems have changed — they're more complex — but we have more tools for handling them. •

Every night your most valuable asset walks out on you.

People who need software to care for their people...

need Genesys Human Resource Management Systems.

With the passage of tax reform legislation in 1986, HRMS managers are faced with a whole new world of regulations, reporting requirements and record-keeping.

Coupled with ever-increasing choices in compensation, benefits and pension plans, the need for easy-to-use, reliable, flexible software is greater than ever. Take the first step and learn about Genesys.

Built around advanced, easy-to-use packages, Genesys delivers to HRMS users the ability to implement their own applications, with no artificial constraints imposed by outmoded technology.

For MIS management, Genesys HRM software is a new beginning. Featuring a *proven* Integrated Development System called AL 2000, Genesys now provides everything a leading-edge MIS department needs to satisfy users. Genesys systems are available in OS or DOS, and as an IMS database management system.

Call or write Genesys Software Systems today. Because people who need software for people – and rely on Genesys – are the luckiest people of all.

Software for People People

Genesys
SOFTWARE SYSTEMS, INC.
20 Ballard Way, Lawrence, MA 01843
(617) 685-5400

PROFILE BY MICKEY WILLIAMSON

A manager for all seasons

Leland McGraw, Chevron's DP chief, leads his staff with a do-it-now philosophy and an aggressive management style that changes with the times

Not every change he has seen in the past 20 years has been an improvement, but Leland C. McGraw, head of information services for Chevron Corp., has no wish to turn back the clock.

"We were, 20 years ago, still in the embryonic stages of learning how to manage this business," he says. "We made a lot of mistakes over the years, but by and large we benefited from them. I'm not one to try to bring back the good old days."

McGraw, 62, is both vice-president of information technology for Chevron and president of its subsidiary, Chevron Information Technology Co. He came to Standard Oil Company of California, which later became Chevron, 39 years ago, a young MBA from the Stanford University Graduate School of Business Administration. Today he presides over $300 million worth of fixed assets and a yearly operating budget of about $240 million.

He set up the company's first centralized computer services department, oversaw the consolidation of information systems for about 15 operating subsidiaries and managed the merger of two giant oil companies' information systems when Chevron acquired Gulf Oil Co. in 1984 in a $13.3 billion deal.

The Chevron-Gulf merger taught McGraw valuable management lessons, namely, "to do the most thorough job you can in planning the front end, to think through all the various scenarios in as much detail as possible and then to share those plans with the key people involved. Planning is absolutely key," he stresses.

As soon as top management endorses a plan, the next step is to be sure that those individuals involved in implementing it completely understand "the game plan, the target, where they're trying to go and when. My experience," McGraw continues, "is that when the players understand the ground rules, it's absolutely amazing how they perform.

"I have a philosophy: Time delay does not buy you anything in my view. Once you have decided what you are going to do, then do it as rapidly as possible. It's disruptive, it causes problems, but delays buy you even more problems," McGraw asserts.

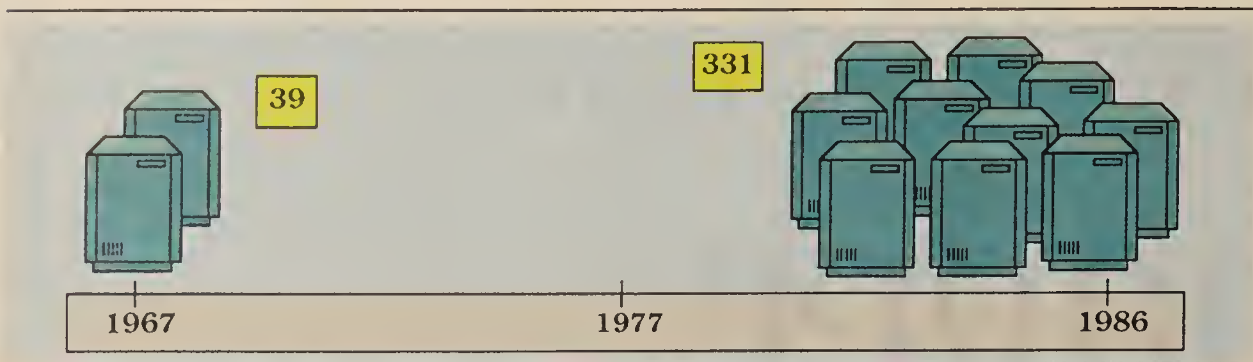
The first step he took when he was given responsibility for merging the financial and controller functions and data processing of the two companies was to form a joint Chevron-Gulf systems review team, composed of senior members of both firms with their primary responsibility being applications development.

The review team determined how Gulf and Chevron handled each application area and then recommended which system should survive in

MCGRAW CAME TO CHEVRON 39 YEARS AGO, A YOUNG MBA FROM STANFORD UNIVERSITY.

CINDY CHARLES/GAMMA LIAISON

Williamson is a technical journalist based in Warwick, Mass.



INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: MITCHELL J. HAYES

Installed medium-scale models:

- Managers searching for a 17- to 128-user medium-scale system in 1967 could choose from 39 models; by 1986, that number jumped to 331

the new organization.

"Our goal," McGraw says, "was to pick the best for survival. Quite candidly, there was some bias to select the Chevron way if it was a close call, because we felt it would be less disruptive. There were a few Gulf applications that were survivors."

The applications review team was one of 23 reporting to McGraw during the merger. "We made some fairly extensive strategic studies as to how we should configure the data centers and the people and how they should be located," Mcgraw recalls. "There were some key decision points. Gulf had about four major data centers, and we collapsed those in less than one year into our two data centers. It was a huge undertaking."

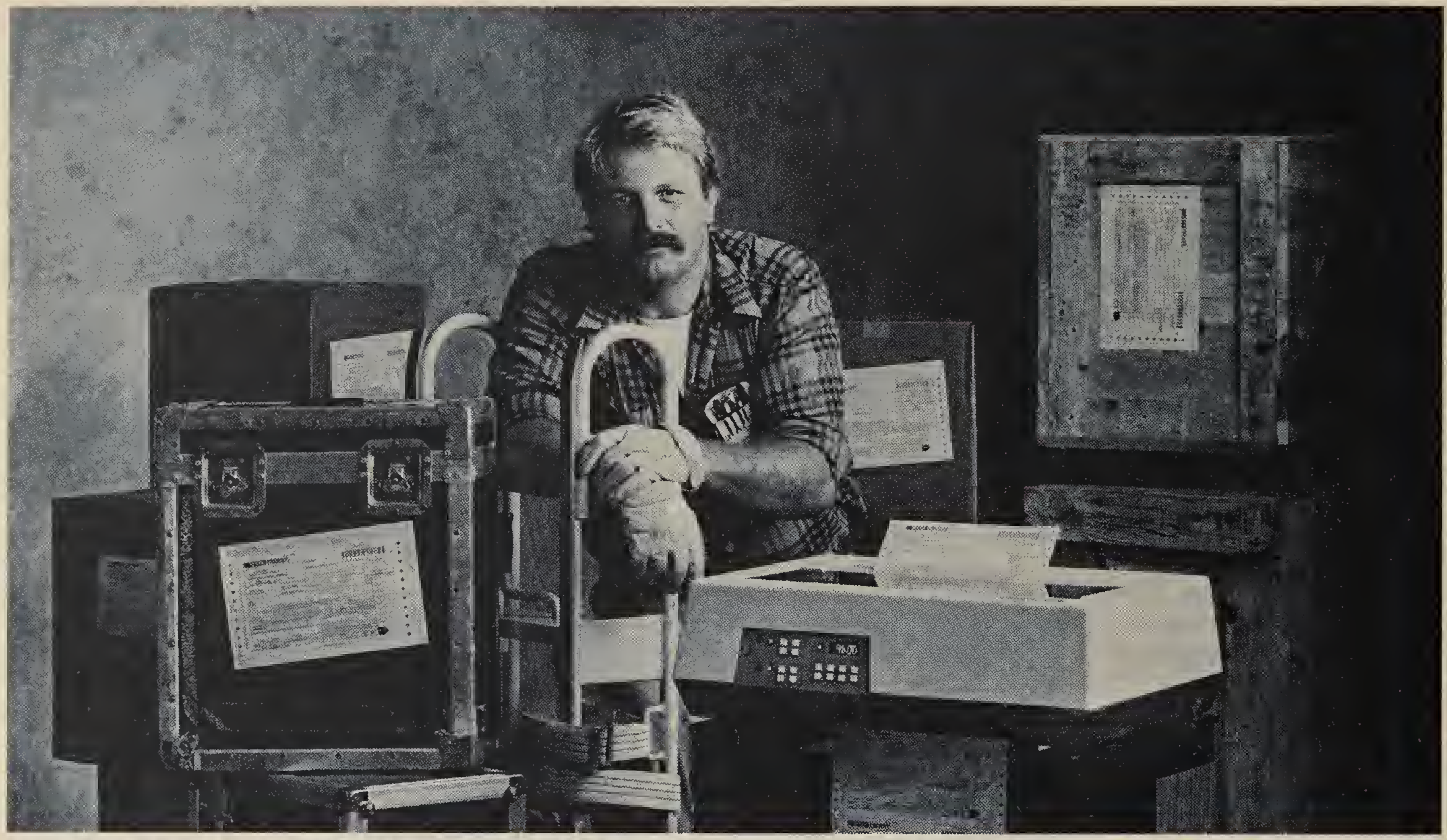
McGraw says he realizes from experience how MIS management style has changed. "I think that 20 years ago, our management tended to be somewhat autocratic. Today, there is a greater awareness of the individuals and their needs and desires," he says. "It's a growing recognition that people, not our capital or raw materials, are really our most important asset."

CINDY CHARLES

> "TODAY, the organization has grown to a size where I don't know my people as well as I used to. I miss that."
>
> LELAND C. MCGRAW
> CHEVRON CORP.

According to McGraw, the changing business climate also forced changes in management style. Managers today, he says, must be poised to respond quickly to changes in the marketplace and technology.

It is fortunate, therefore, McGraw says, that the people in MIS today are generally better prepared than they were 20 years ago. But, while it is helpful to have employees come into the company with more skills, it presents another management challenge. Not only are the skill levels of systems professionals higher today, but so are their expectations. They think more about where their careers are going, and McGraw claims management is challenged to provide



WORKING CLASS HEROES.

The Datasouth High Performance Matrix Printers.

Power. Toughness. Sticking to the job until the work gets done. These are some of the working-class virtues we build into Datasouth printers. Giving the DS 180 and DS 220 the proven ability to run around the clock, around the calendar, in some of the toughest applications imaginable.

That kind of blue-collar reliability is the result of a very advanced design philosophy. One that created two hard-working matrix printers perfect for your medium-speed printing requirements, from 180 to 220 cps. Ready to take on multipart forms of up to 6 layers. Or produce Near Letter Quality text at 45 cps for word-processing applications. And although they're tough, Datasouth printers are easy to use, with front panel controls instead of dipswitches and jumpers.

Each and every DS 180 and DS 220 printer that comes out of our Charlotte, North Carolina plant has been put together and inspected by hard-working people who take a lot of pride in building the world's toughest printer right here.

Put a working-class printer to work for you. To find your nearest Datasouth distributor, call us at 1-800-222-4528.

Datasouth
AMERICA'S HIGH PERFORMANCE PRINTER COMPANY

P.O. Box 240947, Charlotte, NC 28224, (704) 523-8500, Tlx: 6843018, DASO UW SALES: 1-800-222-4528, SERVICE: 1-800-438-5050; West Coast Office: 415-940-9828.

clearly delineated opportunities for advancement, an "exciting" work environment and supportive facilities.

Currently, McGraw is responsible for some 2,000 employees, 1,400 of whom are information systems professionals. His employees provide computer systems development and data processing services to virtually all of Chevron's lines of business except those engaged in geological science, oil field research and manufacturing process control.

Under McGraw, an 800-member computer applications department builds or buys and maintains the applications that run the giant oil company. The computer operation department runs two huge data processing centers, one in Concord, Calif., the other in San Ramon, Calif. The communications technology department provides voice and data communications on telephone, radio and some 6,000 miles of company-owned microwave links.

Chevron Information Technology has provided time-sharing services to the rest of the corporation for more than 15 years, offering a number of on-line applications. "And, of course, we provide a lot of support services for PCs," McGraw adds. About 5,000 Chevron employees use PCs, while more than 16,000 use the online time-sharing system.

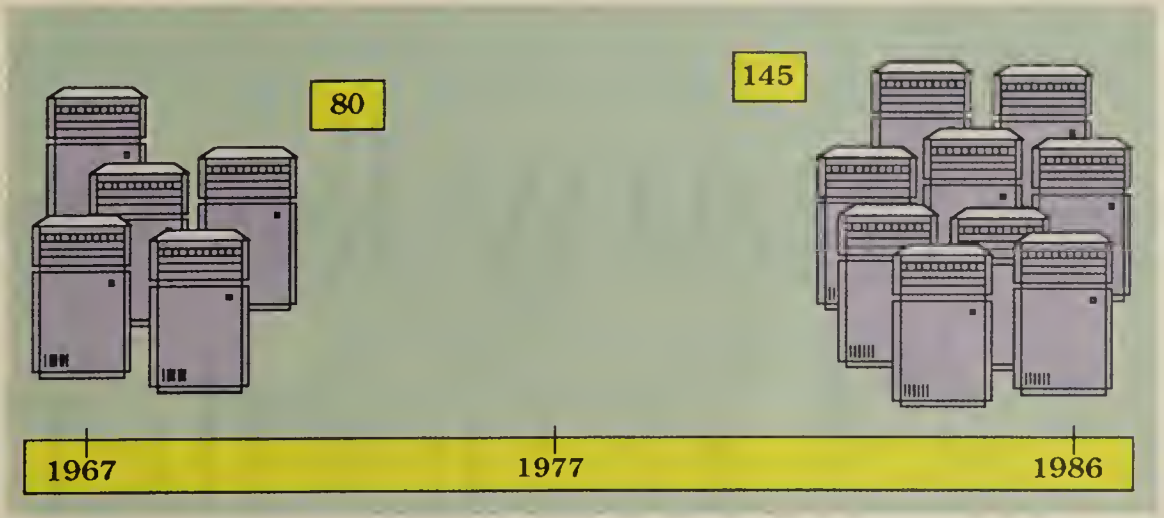
Moving toward centralization

While the bulk of Chevron Information Technology's employees are in San Ramon or Concord, some are dispersed to about 25 other facilities, including various user organizations, where they provide technical support. The organization has a strongly centralized orientation, a far cry from what McGraw inherited 22 years ago when, as assistant controller, he "first became involved in a major way with data processing."

The oil company was largely decentralized, with at least 15 distinct operating companies and "many people in different organizations working independently on the same problems," he explains. "We had, for example, at least eight payroll systems and five different credit card systems." Computer operations were eventually centralized in a newly formed computer services department, with McGraw as general manager, reporting to the financial vice-president.

The computer services department was barely 8 years old when McGraw received another assignment. The Standard Oil of California board of directors decided to absorb six independent subsidiaries into a single company, to be called Chevron U.S.A. McGraw was appointed financial vice-president of the new company, with the responsibility for consolidating the financial affairs of all six companies. It was that challenge that prepared him for the merger with Gulf Oil in 1984.

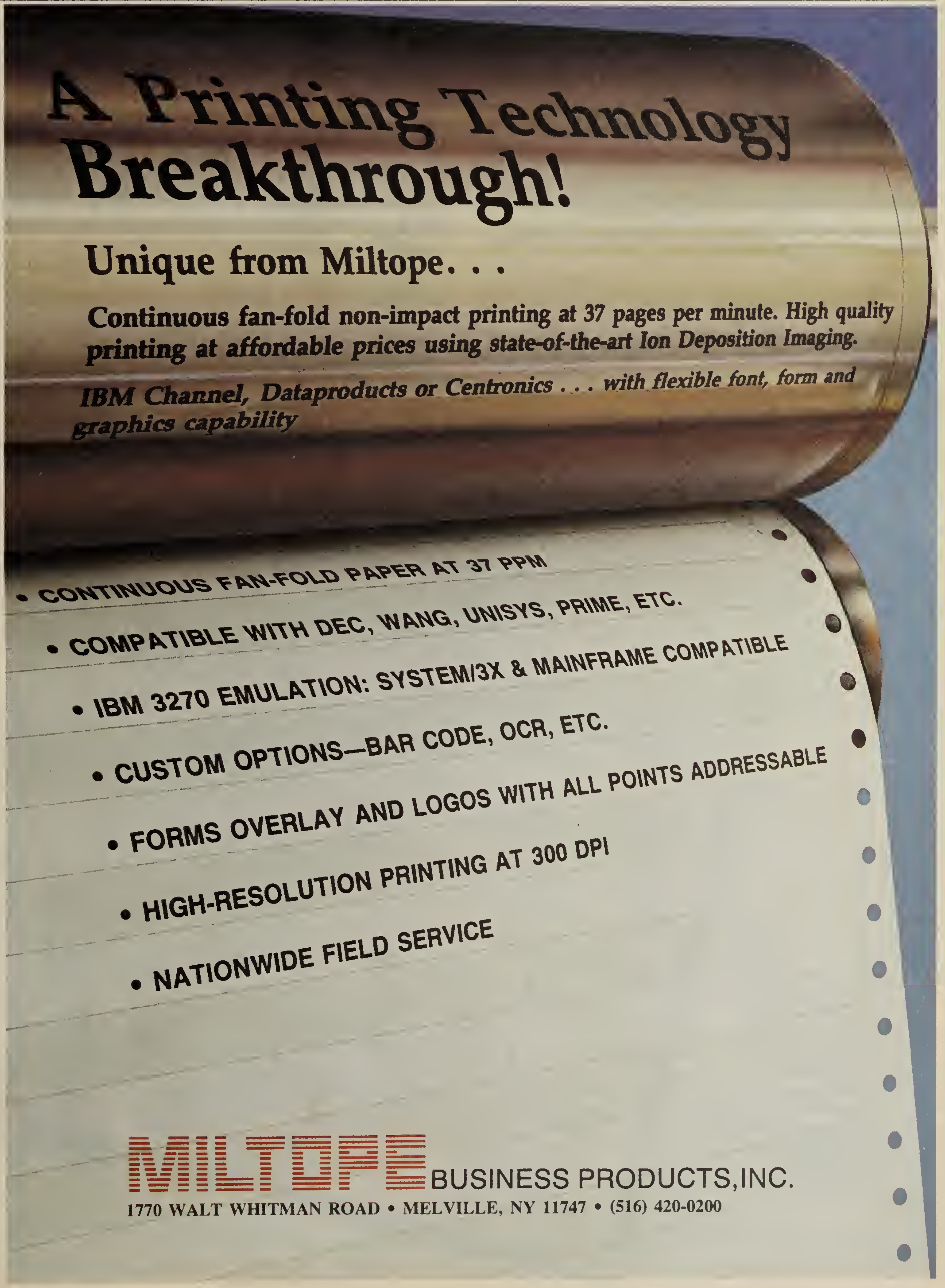
Both McGraw's duties and his management style have changed significantly during the years. Although he generally approves of the changes, McGraw is not without regrets. "We've learned and grown a lot in knowing how to manage this whole complex information function, but there is one area that I do miss," he says. "Twenty years ago, the number of people involved in information systems was much smaller, and I knew many of them by their first name. Today, the organization has grown to a size where I work hard at it, but I don't know my people as well as I used to. I sort of miss that. I think you lose something when you don't have that personal touch." •



Installed large-scale models: Systems that support more than 128 users

• While managers in 1967 could choose from 80 different large-system models, managers going into 1987 could choose from 145

INFORMATION PROVIDED BY INTERNATIONAL DATA CORP.
CW ILLUSTRATION: SUSAN ALDAM


A Printing Technology Breakthrough!

Unique from Miltope. . .

Continuous fan-fold non-impact printing at 37 pages per minute. High quality printing at affordable prices using state-of-the-art Ion Deposition Imaging.

IBM Channel, Dataproducts or Centronics . . . with flexible font, form and graphics capability

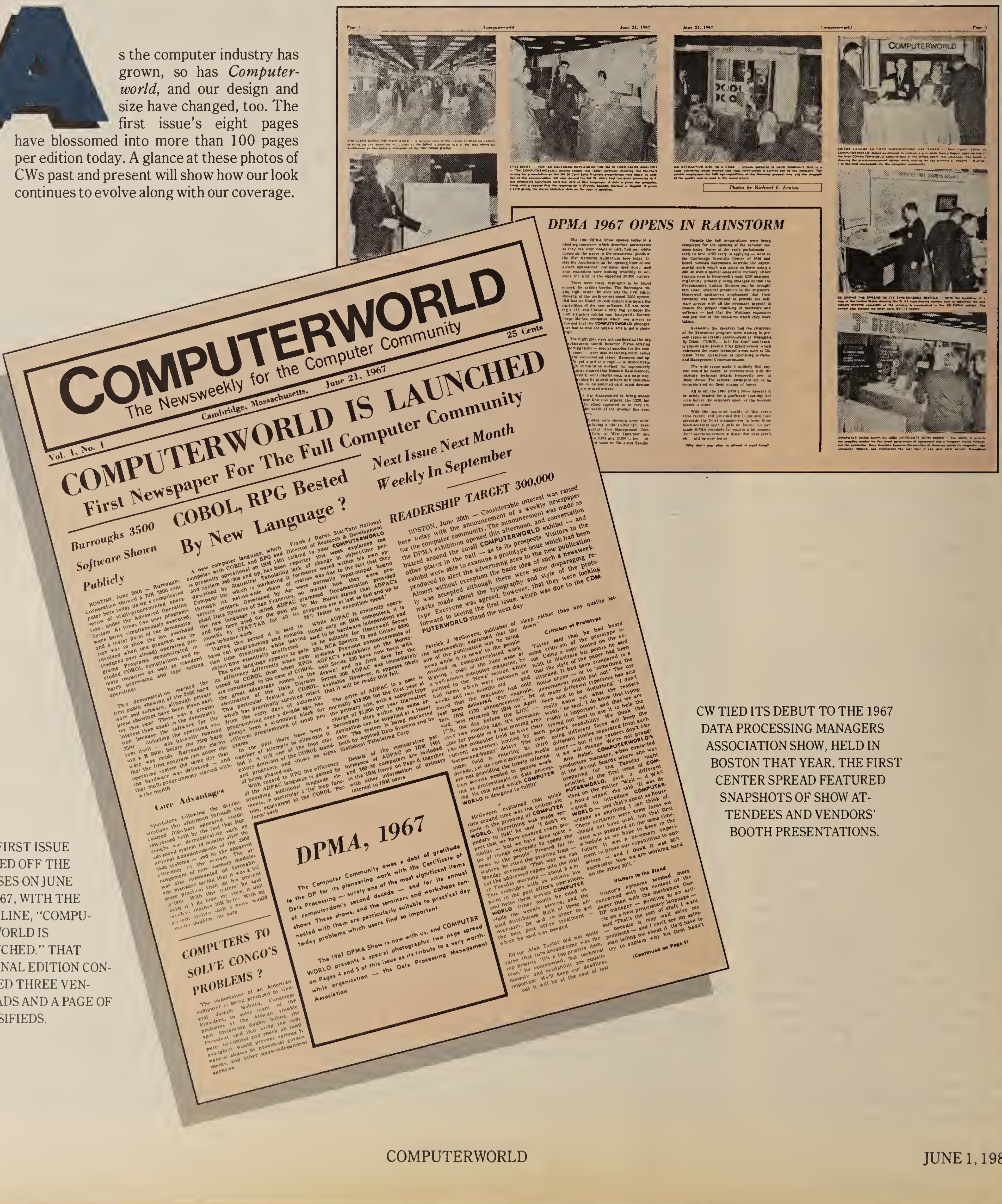
- CONTINUOUS FAN-FOLD PAPER AT 37 PPM
- COMPATIBLE WITH DEC, WANG, UNISYS, PRIME, ETC.
- IBM 3270 EMULATION: SYSTEM/3X & MAINFRAME COMPATIBLE
- CUSTOM OPTIONS—BAR CODE, OCR, ETC.
- FORMS OVERLAY AND LOGOS WITH ALL POINTS ADDRESSABLE
- HIGH-RESOLUTION PRINTING AT 300 DPI
- NATIONWIDE FIELD SERVICE

MILTOPE BUSINESS PRODUCTS, INC.
1770 WALT WHITMAN ROAD • MELVILLE, NY 11747 • (516) 420-0200

The many faces of Computerworld

As the computer industry has grown, so has *Computerworld*, and our design and size have changed, too. The first issue's eight pages have blossomed into more than 100 pages per edition today. A glance at these photos of CWs past and present will show how our look continues to evolve along with our coverage.

1967



Photos by Richard E. Fenton

DPMA 1967 OPENS IN RAINSTORM

COMPUTERWORLD
The Newsweekly for the Computer Community
Cambridge, Massachusetts, June 21, 1967
25 Cents
Vol. 1, No. 1

COMPUTERWORLD IS LAUNCHED

First Newspaper For The Full Computer Community

Next Issue Next Month
Weekly In September

Burroughs 3500 Software Shown Publicly

BOSTON, June 20th — Burroughs Corporation showed a 70K 3500 computer here today doing a complicated series of multi-programming operations under the Advanced Operating System. At times five user programs were being simultaneously executed, and a major point of the demonstration was to show the low overhead involved when one program was introduced over already operating programs. Programs demonstrated included COBOL compilations, and remote inquiries as well as standard batch processing and tape sorting operations.

This demonstration marked the first public showing of the 3500 hardware and software, although private press showings have been given earlier this year. There was a greater interest than usual in the demonstration because the software for the 3500 — including the operating system itself — was basically running on a B 5500 before the 3500 hardware was ready. Burroughs claims that the first program ran under the operating system the same day that the hardware was delivered — and that multi-programming started within the month.

Core Advantages

Spectators following the demonstrations this afternoon through the colored flip-chart appeared visibly impressed both by the fact that Burroughs was demonstrating such an advanced system 14 months after the original announcements of the 3500 systems — and by the apparent efficiency of the system. The arrangement of core memory modules was also commented on favorably, one manager saying that it was a lot more practical than on his present system. 'With this system' he said 'even if I do blow my core, it only involves another 10K bytes. With my present system such a move would involve doubling my core'

COMPUTERS TO SOLVE CONGO'S PROBLEMS ?

The importation of an American computer is being arranged by General Joseph Mobutu, Congolese President, to solve many of the problems of the African trouble spot. Instancing double billing, the President said that using the computer to control and check on fund availability would prevent various financial abuses by provincial governments, and other quasi-independent agencies

COBOL, RPG Bested By New Language ?

A new computer language, which competes with COBOL and RPG and is presently operational on IBM 1401 and System 360/30s and up, has been described by Statistical Tabulating Company Inc which is marketing it through its nation-wide chain of service centers. Developed by Applied Data Systems of San Francisco, the new language is called ADPAC and has been used for the past six months by STAT-TAB for all its own in-house work.

During this period it is said to have cut programming and compilation time drastically, while leaving object-time essentially unaffected.

The new language appears to gain its efficiency differently when compared to COBOL than when RPGs are considered. In the case of COBOL the great advantage comes in the elimination of the Data Division. This particular feature of COBOL which has practically survived intact from the early days of automatic programming over a decade ago, has always been a stumbling block for efficient programming of small programs.

In the past there have been a number of attempts to eliminate it, but it is still one of the four obligatory divisions of the COBOL standard programs, and shows no signs of being phased out.

With regard to RPG the efficiency of the ADPAC language is gained by providing additional language elements, in particular a 'Do' loop function, equivalent to the COBOL 'Perform' verb

Frank J Burns, Stat-Tabs National Director of Research & Development talking to your COMPUTERWORLD reporter this week explained the lack of change in object-time performance noted within his own operation was due to the fact that they were normally input-output bound no matter how they were programmed. Documentation provided by Mr. Burns stated that ADPAC's programs are at last as fast and up to 35% faster in execution speed.'

While ADPAC is presently operational only on IBM computers, it is said to be hardware independent and to be suitable for Honeywell Series 200, RCA Spectra 70 and Univac 9300 systems. Previous announcements of ADPAC's availability on the Honeywell Series 200 have now been withdrawn; and no firm date for the Series 200 ADPAC was immediately available. However, it appears likely that it will be ready this fall.

The price of ADPAC to a user is normally $15,000 for the first year at the primary site, with a support-type charge of $1,000 per year thereafter. Secondary sites within the same organization can be supplied at a lesser rate. The system is being marketed both by Applied Data Systems and by Statistical Tabulating Corp.

Details of the comparative performance of ADPAC on IBM 1401 and 360-30 computers are included in the 'IBM Items' on Page 6, together with other information of primary interest to IBM users

READERSHIP TARGET 300,000

BOSTON, June 20th — Considerable interest was raised here today with the announcement of a weekly newspaper for the computer community. The announcement was made as the DPMA exhibition opened this afternoon, and conversation buzzed around the small COMPUTERWORLD exhibit — and other places in the hall — as to its prospects. Visitors to the exhibit were able to examine a prototype issue which had been produced to alert the advertising area to the new publication. Almost without exception the basic idea of such a newsweekly was accepted although there were some disparaging remarks made about the typography and style of the prototype. Everyone was agreed, however, that they were looking forward to seeing the first issue, which was due to the COMPUTERWORLD stand the next day.

Patrick J McGovern, publisher of the newsweekly, explained that the aim of the publication was 'to bring news while it is news' to the people involved in computer-related work. Waving a copy of the June issue of a well-known computer magazine, he pointed to the 'News' section which had items which were between six weeks and two months old and noted that the magazine had only just been delivered. 'For example', he said, 'this IBM 1130 announcement', he said, 'was released by IBM on April 17th, the day before the SJCC — over two months ago. It's unreasonable for people in a fast moving area like the computer field to have their current awareness limited by such 'horses-and-buggy' delays. The computer field is entering its third decade, yet its communications media are not providing the timely information service needed by people working as professionals in data processing. It is this need which COMPUTERWORLD is designed to fulfill'

McGovern explained that quick turn-around time was the critical element in the planning of COMPUTERWORLD. 'Everything was made secondary to that' he said 'I don't expect that we have covered every possibility — but we have done quite a lot of things expressly to speed the news to the people.' Pressed for instances, he cited the printing time — Monday evenings. 'That way we can get the addressed copies into the mail on Tuesday morning — about 5 a.m. This coincides with an activity low point in the post office's operations, and helps them service COMPUTERWORLD.' Other points he cited include the weekly service, and the paid distribution. Both of these are necessary, he said, in order to get the best post office treatment — which he said was needed.

Editor Alan Taylor did not quite agree that turn around time was the top priority. 'It's a top priority item, true,' he commented, 'but technical honesty and readability are equally important. We'll keep our deadlines — but it will be at the cost of lost sleep rather than any quality letdown.'

Criticism of Prototype

Taylor said that he had heard some criticism of the prototype issue. Using a copy posted on the exhibit to illustrate his points he said that the style of the paper had been attacked. It had been compared to a house organ — or to 'something the government might put out.' The use of many different typefaces has also been said to be 'disturbing'. 'I don't really know yet what the readers want,' he said. 'I do know that typography is important, and that we are trying our best to use it to help the paper's readability. We think that using different faces will keep different stories separated from each other — but if the readers don't like it we will change. We're not proud'

Ann Babel, COMPUTERWORLD's production manager, when contacted at the lay-out boards where she was preparing for the Tuesday printing of the first issue of COMPUTERWORLD, gave a different slant on the matter. 'Well — it WAS a house organ', she said. 'It was designed to introduce COMPUTERWORLD — and that's about as house organy as anything I can think of. There certainly were some faces we should not have used, but that first issue was prepared on the same time-schedule as we hope to keep in the future. It was a necessary experiment to prove our capabilities to ourselves — and I think it was 80% successful. Now we are working hard on the other 20%.'

Visitors to the Stand

Visitor's opinions seemed more concerned with the content of the paper than with the mechanics. One DP manager — pointing to an article on a new proprietary language — said 'That's the sort of stuff I want — because it may well solve my problems — and I can't see my salesman telling me about it. He'd have to try to explain why his firm hadn't'

(Continued on Page 6)

DPMA, 1967

The Computer Community owes a debt of gratitude to the DP for its pioneering work with the Certificate of Data Processing — surely one of the most significant items of computerdom's second decade — and for its annual shows. These shows, and the seminars and workshops connected with them are particularly suitable to practical day-to-day problems which users find so important.

The 1967 DPMA Show is now with us, and COMPUTERWORLD presents a special photographic two page spread on Pages 4 and 5 of this issue as its tribute to a very worthwhile organization — the Data Processing Management Association

CW TIED ITS DEBUT TO THE 1967 DATA PROCESSING MANAGERS ASSOCIATION SHOW, HELD IN BOSTON THAT YEAR. THE FIRST CENTER SPREAD FEATURED SNAPSHOTS OF SHOW ATTENDEES AND VENDORS' BOOTH PRESENTATIONS.

OUR FIRST ISSUE ROLLED OFF THE PRESSES ON JUNE 21, 1967, WITH THE HEADLINE, "COMPUTERWORLD IS LAUNCHED." THAT ORIGINAL EDITION CONTAINED THREE VENDOR ADS AND A PAGE OF CLASSIFIEDS.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Leasco to Open First Time Sharing Bureau
Developer Claims 'Peoc' Better Than Pert-Cost
Scientific Data Systems Offers Small Computer
Is System 'Theft' Scandal or Rumor?
Stocks Off 1st Time in 2 Months
On the Inside

1968

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
DPF&G and IBM Settle Suit; ADR Keeps Autoflow Rights
Nader Leads Public At ACM's Convention
Operable in Mid-70s
Bell Digital Network Predicted
System Offers More for Less
On the Inside

1970

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
NEWS IN BRIEF
'Packaged' B700s Have S/3-Like RPG, Key Entry
IBM 370 Lease Has No Overtime Charges
Rating High on CAI
Money Men Reappraise 360, Find $ Value Zero in 1978
Hawaii to Double-Check Election Results Programs
On the Inside This Week
Private Line Charges
Bell Asks Rate Revision

1973

Caution: CRTs May Be Eye Hazard
COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
Carter Pledges Influence To Develop Privacy Policy
Firmware Lets Mini Emulate IBM 370
New Yorkers' Systems Hit Hard By Mid-Week Lightning Storm
NEWSPAPER

1974

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
IBM Packs System/38 With Technological 'Firsts'
If Employers Take Carter Cue
Many DPers May Feel Salary Pinch
Processor Lets IBM 3270s Run on X.25 Packet Nets
MVS Insights Gained
NEWSPAPER

1978

1987

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
INSIDE
IBM stakes claim to next PC standard
OS/2 to bind PCs to hosts, leap 640K wall
Bus, disk changes anchor feature-packed systems
Announcement highlights
Full Report
CSA revamp seen luring sites back to IBM service
Telenet deal merges T1, packet nets
NEWSPAPER

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
U.S. Drops IBM Suit, Settles With AT&T
• But Snag Develops as Judge Refuses to Dismiss Bell Case
• Justice Department Decides IBM Case 'Without Merit'
Pact 'Modifies' Consent Decree
Bigness Not Bad, Baxter Explains
ANALYSIS
The AT&T Settlement: Whose Victory?
INSIDE
• THE END OF THE IBM CASE What Users Think What Software Vendors Fear Whether IBM Will Change How It Uses Business
• THE BELL SETTLEMENT What Concerns Vendors, What Congress Still Wants

1982

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
COMPUTERWO
Microvax II debuts; users give high marks
TOP OF THE NEWS
Corporate moves: A tale of two DP shops
With local division's buy out, DP center starts from scratch
DP center turned business finds mind-set must change
NEWSPAPER

1985

CURRENTLY, AN EDITORIAL STAFF OF 52 PRODUCES *COMPUTERWORLD*, COMPARED WITH 1967'S TWO-MAN CREW. THE PAPER OPERATES FOUR SATELLITE NEWS BUREAUS AND GLEANS ADDITIONAL INFORMATION FROM THE IDG COMMUNICATIONS INTERNATIONAL NEWS SERVICE.

PROFILE BY MICKEY WILLIAMSON

Taking care of business

Cigna MIS executive Allen Loren faces the challenge of matching the insurance giant's software and systems investments to its bottom-line goals

Comparing software development today with the process 20 years ago, Allen Z. Loren, senior vice-president of insurance conglomerate Cigna Corp., says he sees "a lot more similarities than differences." Cobol is still the most widely used language, and our challenge remains one of "trying to make technology make a difference in the market."

Loren claims, however, that both his customers and the climate in which he works have changed greatly over the years. Customers, he says, have grown "smarter" as the locus of project decision making has migrated up the organization chart.

And changes in systems development have also occurred. "One big change as far as Cigna is concerned," Loren says, "is that the person making the decision is the person running the business rather than the person running the product line." Loren says he sees the product manager as a lobbyist who always wants perfection. "The person who runs the business can never afford perfection. The business manager has to make trade-offs: 'How much is this facility worth, both in terms of time and energy, vs. the other things that I want to do?' "

'Mystique has gone out of the game'

With more sophisticated customers, better tools and more options in hardware and software, Loren claims the information systems industry has become more mature. Most of all, he says, "The mystique has gone out of this game, which, I think, is good."

He adds that Cigna Systems, the company's DP arm, is run "like any other part of the business, not as if it's some kind of special art. I'm glad to see that, because you can't manage $350 million of capital with mystique. It just doesn't make any sense."

At 49, Loren is the quintessential business-oriented information systems executive. He spends his time monitoring conditions in the insurance industry and the economy as a whole and meeting with executives of the giant insurance company's various business units to ensure that the services his organization is providing match the strategic goals of the Cigna companies.

A forceful proponent of matching technological investment with business goals, Loren has served as guest lecturer for institutions such as the Wharton School at the University of Pennsylvania, the Society of Management Information Systems, the IBM Advanced Business Institute and the National Academy of Science.

Loren says he sees the proliferation of technologies as a double-edged sword. No longer do memory and storage restrictions force such painstaking analysis and design. Yet, he says, "the cheapness of memory, the cheapness of storage, have led to systems that are more complex." All this has made it possible to solve ever more complex problems.

As president of Cigna's Systems Division, Loren has good reason to know what it takes to

LOREN SEES THE PROLIFERATION OF TECHNOLOGIES AS A DOUBLE-EDGED SWORD.

Williamson is a technical journalist based in Warwick, Mass.

solve complex business problems. Cigna Systems employs some 4,000 people, about 8% of the financial services organization's work force.

Loren presides over a budget of $350 million; about half is spent on applications, and the remainder is spent on what Loren calls "running our factory — data centers, communication networks and what have you." Of the applications expenditures, Loren estimates that 55% goes to development and the balance to the maintenance of existing software.

In 1971, Loren came to Insurance Company of North America (INA) — which, along with Connecticut General Corp., makes up Cigna — after a stint as a vice-president of the Reliance Group Holdings, Inc. At Reliance, he was in charge of the software company's consulting arm.

"I sold systems development and systems operations services to government, to publishing companies, to hardware manufacturers. We built compilers and assemblers for people like Hughes [Aircraft Corp.] and DEC and DG," he says.

Within a year, Loren had advanced to vice-president and director of INA's Information Systems Division. Today, he heads an organization that provides technology support for each of Cigna's four major business groups: the Employee Benefits and Health Care Group, the Property and Casualty Group, financial planners in the Individual Financial Services Group and the Cigna Investment Group.

While Loren says he considers these four organizations his customers, Cigna has others. "There are two sets of customers here," he says. "There are internal customers, and then there are my customers' customers — outside organizations like United Technologies Corp., GE, GM and IBM. They are using our systems, or we are building systems for them, extending our technology to their playing field."

The best of two management schemes

Loren describes Cigna Systems as "vertically integrated. It is all managed out of my office, but the staff is geographically dispersed and sits next to the customer, by design." Such a setup, Loren says, borrows the best of both centralized and decentralized operations and creates what he calls a "dispersed world."

Although it was not designed to be a profit center, Loren says he runs Cigna Systems as a business, with financial accounting, chargebacks to the customer organization and an executive who manages the relationship with each of Cigna's business groups. The equipment in Cigna Systems' three major data centers — in Voorhees, N.J., Windsor, Conn., and Thornton, Colo. — is valued at more than $100 million, handles an average of five million transactions each day and is capable of storing a trillion characters of information on-line. "It's a substantial company in its own right," Loren says.

Loren's view of how to select a project for development has changed over the years. "We were very ROE [return-on-equity] oriented 20 years ago," he says, "and we are less so now. Marketing-oriented systems are hard to do ROEs on."

Development techniques have changed to some extent, too, Loren says. Fortran is used less. Every member of the staff now has a terminal to work on. A lot of development is done in CGI Systems, Inc.'s Pacbase, a fourth-generation language that generates Cobol source code and makes maintenance relatively inexpensive. Other development languages are in use as well, including Information Builders, Inc.'s Focus and "a whole litany of them," Loren adds.

■ FACING NEW CHALLENGES

"One of the problems we wrestle with today is managing all these diverse new technologies. In the old days, we had fewer choices. From a communications point of view, there was one vendor — AT&T. From a computer point of view, there was one technology — mainframe. So, while we had fewer tools to solve a problem, we had less trouble with those tools." — Allen Z. Loren.

Other improvements over the years include "better documentation aids, better scheduling tools, better project management tools, the manager's workstation that arms the project manager with a whole set of systems for estimating and project tracking. That's all the good news," he says.

The other side of the coin is the fact that customers' expectations keep rising, and Loren puts a considerable amount of emphasis on downsizing their demands. "Customers want the moon, and our own people like to promise the moon and deliver it in phases. We are constantly pushing them toward packaged solutions," he says.

Part of Loren's strategy is "software sharing — using systems from one of our businesses in another of our businesses. The key to that is lowering the expectation on the part of the customer. Once the customer knows that a custom job will never deliver what we say it will, even though we promise, they begin to look at other solutions. I think we have been pretty successful there," he adds, "but it's still a struggle."

Molding a development project

In approaching a development project, Loren says, "Most of our focus is on the initial scoping of the project. If we can do that well, then we can shape the work and focus it — either on an existing system that we have inside or a package on the outside."

Either way, the result is "a greatly reduced development activity," he explains.

Loren does not downplay the opportunities for productivity in the actual building phase of the development project, brought about mainly by fourth-generation languages and the writing of "reusable code" — modules that can be carried from one application to another.

But there, he says, "The potential is not as great. If we can take a project that somebody thinks is going to cost $10 million and make it $5 million through rescoping it, we've done more with a relatively few people and a short amount of time than we can with all the tools on the rest of it." •

TIMELINE: *Hardware*

1967
An $8,000 price tag graces the new Philco-Ford color monitor.

IBM introduces the 360/25. DEC develops the PDP-10.

1968
Univac launches the 9400 to compete with IBM's 360s.

Burroughs jumps into the low-cost computer market with the B500. The system runs Cobol — provided the memory is there on the 9.6K core unit.

Edson deCastro, former DEC PDP-8 chief engineer, starts Data General and announces the first commercial 16-bit minicomputer, the Nova.

1969
RCA brings out the high-end Spectra 70/60.

IBM targets small-business users with the System/3. GE expands the 600 family with its fastest system, the 655.

1970
DEC's sales force pounds the pavement to sell the company's 16-bit PDP-11. IBM's 370/145 soon follows, along with the Burroughs B700 series.

Another alternative to IBM's 370/155 emerges as XDS introduces the Sigma 9. Univac develops the multiprocessor 1110.

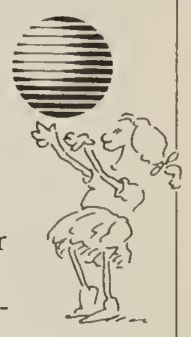
1971
The IBM 370/135 and 195 debut. In response, Honeywell unveils its large-scale series, the 6000.

A buzzword is born: "distributed processing" is the key to Control Data's Cyber/70 mainframe family.

1972
Memorex follows DG into the distributed processing arena with the MRX/40 and 50.

Honeywell unwraps the Series 2000, while Burroughs nearly doubles its arsenal of medium-scale computers.

1973
Univac's medium-scale mainframe, the 90/60, debuts.



1974
Xerox switches to multiple processor architecture in its 550 and 560 mainframes.

CDC's Cyber/170 series features integrated-circuit logic and metal-oxide semiconductor memory.

The Honeywell systems hodgepodge gives way to a compatible group of CPUs in the Series 60.

1975
Ed Roberts and Bill Yates of MIT market Altair, the first personal computer.

IBM unwraps the System/32, and follows later in the year with the 5100.

The Cray-1 supercomputer is introduced as the fastest computer on earth. Univac shows its 1110/20 and 1110/40.

The last straw. A drastic dip in earnings forces Xerox to withdraw from the mainframe business.

New products — IMS Associates introduces the Hypercube II; the Tandem 16 Nonstop system arrives; Burroughs unveils its 800 series.

1976
Superminicomputers are introduced by Perkin-Elmer and Gould SEL, followed shortly by DEC's VAX-11/780 (in 1977) and Prime Computer's 750. The Series/1 is thrown into the minicomputer fray by IBM.

Continued on page 20th/32

ILLUSTRATIONS BY CHRIS DEMAREST

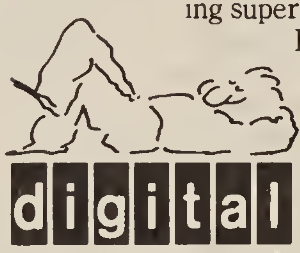
From page 20th/31

Burroughs brings out the B80 while the HP 3000 Series II debuts from Hewlett-Packard. CDC introduces the Cyber/70 Model 71.

1977

Steve Wozniak and Steve Jobs found Apple Computer, Inc. and market the garage-born Apple II microcomputer. Through Radio Shack, Tandy Corp. mass-markets its first TRS-80 microcomputer.

IBM unveils the 3033, the first of its 30 series. Itel reacts within six hours of IBM's announcement by unwrapping the AS/6. Burroughs follows Itel and brings out the B6817. Not to be undone, Honeywell restructures its Level 68 large-scale line.



NCR unleashes the N-8350, N-8450, V-8450, N-8560 and V-8560.

1978

National Semiconductor introduces the System 400.

Magnuson Systems pits itself against IBM when it markets the M80 series. Cambridge Memories also enters the IBM 370-compatible fray with three processors.

The HP 3000 Series III and the HP 250 bow from HP.

At last, IBM joins the distributed processing market with the 8100. The System/38 arrives.

1979

Perkin-Elmer undercuts the competition with its 32-bit, 4M-byte supermini, at $33,500.

NCR brings out the 8500 series, Burroughs unveils the B2930 and B3950, and Univac reacts with the 1100/60.

1980

DEC introduces its first large-scale integrated 32-bit mini, the VAX-11/750. DG unwraps the Eclipse MV/8000.

IBM's 3081 and 3033S processors debut. Amdahl comes in swinging with two computers — the 470V/7C and the 470V/7.

1981

Heads turn when Adam Osborne markets the Osborne Portable 1 portable microcomputer.

Apple, Tandy and Commodore quiver as IBM plunges into the micro market with the IBM PC.

Perkin-Elmer undercuts DEC and DG 16-bit computers with a 32-bit processor.

1982

DEC brings out a high-end 32-bit VAX-11 multiprocessing supermini, the 11/730. Perkin-Elmer responds quickly with the high-end 32-bit Series 3200 processor.

NAS takes on the IBM 4341 with a medium-scale processor family — the AS/6100.

Sperry Univac introduces the 1100/90. IBM announces its largest processor to date, the 3084. Honeywell follows with the DPS 88.

1983

Apple hopes to shake up the office systems market with Lisa. The Apple IIE also bows.

IBM's "Peanut" comes out of its shell as the PCjr. At NCC, IBM unveils the System/36.

The NCR 9300 and the 32-bit Honeywell DPS 6/95 bow.

1984

Apple comes to market with the Macintosh.

Gould's Computer Systems Division introduces its first virtual-memory processor, the Powernode 600.

AT&T plunges aggressively into the commercial computer market with the 3B line. IBM buoys its PC sales by unveiling the PC AT.

Wang expands its mid-range VS product line with the VS 65 minicomputer. The Micro PDP-11/73 from DEC bows.

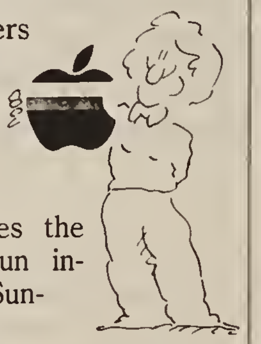
1985

IBM's 3090 Model 200 and the 3090 Model 400 debut. Strong competition forces the company to curtail production of the PCjr.

The Microvax II and the VAX 8650 superminicomputer are unveiled by DEC.

1986

IBM designs its first 32-bit workstation — the RT PC. HP also uses RISC technology in its Series 930 and 950.



Sperry bolsters its product line with the 2200/200.

DG introduces the MV/7800. Sun introduces the Sun-3/110LC and Sun-3/200.

IBM brings out the XT Model 286 and its 9370 minis.

Compaq's Deskpro 386 is first PC to use Intel's 80386.

Sperry gives in to a takeover by Burroughs following two weeks of tense negotiations.

1987

Wang restuctures the top half of its minicomputer line with the VS 7000 series.

IBM attempts to grab control of the corporate micro standard with its Personal System/2. Apple unveils the Macintosh SE and the Macintosh II.

Recently formed Honeywell Bull, Inc. — a company formed by Honeywell, Compagnie des Machines Bull and NEC — presents the DPS 7000 to the U.S.

Prime astounds rivals with a pair of superminis that the company claims pit Prime machines against IBM mainframes.

ILLUSTRATIONS BY CHRIS DEMAREST

Flashbacks

JUNE 7, 1982

FORMER IBM EMPLOYEE KILLS TWO

A former IBM employee goes on a shooting rampage at IBM's Federal Systems Division in Bethesda, Md., killing two employees and injuring eight others.

JULY 4, 1983

THREAT TO OLSEN TRIGGERS FEAR FOR EXECS

A Green Beret is charged with the attempted extortion of $1.25 million from Kenneth Olsen, president and founder of Digital Equipment Corp. U.S. Army Staff Sgt. Marc E. McDonnell, 27, is held on bail pending a hearing.

JULY 30, 1984

HOUSE OKS COMPUTER CRIME BILL

The U.S. House of Representatives takes less than 45 minutes to approve a major computer crime bill that covers unauthorized access to computers used in interstate commerce and the federal government.

COMPUTERWORLD
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
NEWSPAPER
Staff Turnover No Problem, Surveyed Managers Report
Computers to Fuel April Lift-Off Of Space Shuttle 'Columbia'
Contract Closes Union Dispute
Timeplex Unveils Synchronous Modems

FEBRUARY 11, 1985

SALARY GAP PERVADES DP

The Bureau of Labor Statistics reports that women earn almost 22% less than men in computer-related jobs.

JULY 8, 1985

REAGAN SECURITY DIRECTIVE ATTACKED

Congress warns that "Big Brother is here," that is, in a presidential directive that Congress claims gives U.S. military and intelligence officials too much control over computer security in the private sector.

JULY 28, 1986

BIG EIGHT FIRM TIED TO 4GL SNAFU

The New Jersey State Commission of Investigation charges that Price Waterhouse caused a monumental systems logjam at the state's Department of Motor Vehicles when the company misused a fourth-generation language in an attempt to revamp the agency's computer systems.

COMPUTERWORLD
Cullinet exec out in shuffle
Burroughs in drive dispute with big users
Run of the mill California Steel molds MIS on micro base

JANUARY 19, 1987

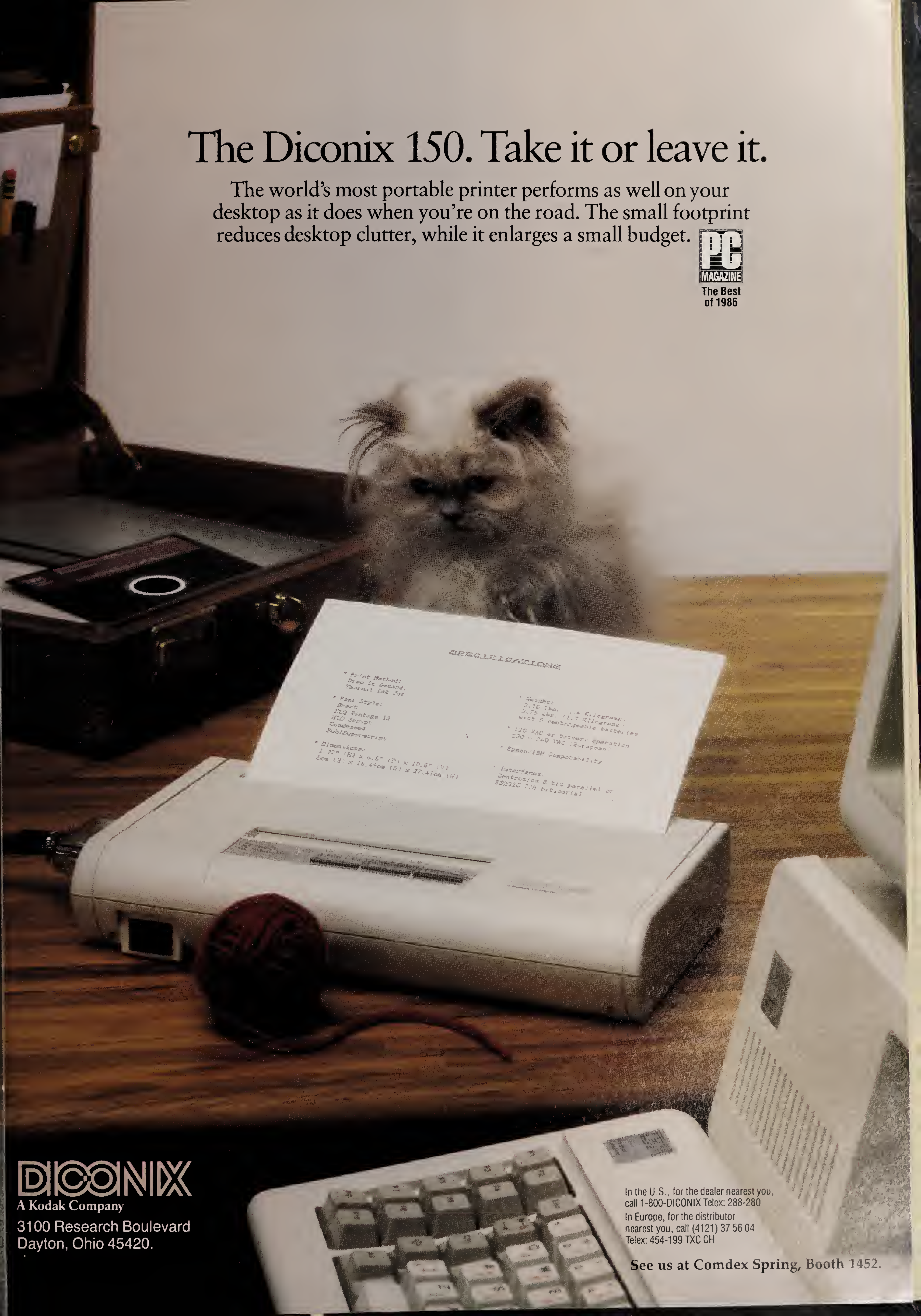
1-2-3 SUE! LOTUS VS. CLONES

Lotus Development Corp. files landmark lawsuits against Paperback Software International, Inc. and Mosaic Software, Inc., alleging that the two firms violated copyright law with products that steal the "look and feel" of Lotus's 1-2-3 spreadsheet product.

APRIL 13, 1987

LOTUS SUED FOR VISICALC "COPY"

Lotus Development Corp.'s "look and feel" suit takes an unexpected turn when SAPC, Inc. — a firm made up of ex-Software Arts, Inc. executives — charges Lotus and company founder Mitch Kapor with copying "the total concept, look and feel" of the once-popular Visicalc. Software Arts originally introduced Visicalc, a spreadsheet software product that by 1985 had lost much of its market to 1-2-3.



The Diconix 150. Take it or leave it.

The world's most portable printer performs as well on your desktop as it does when you're on the road. The small footprint reduces desktop clutter, while it enlarges a small budget.

PC MAGAZINE
The Best
of 1986

SPECIFICATIONS

- Print Method:
  Drop On Demand,
  Thermal Ink Jet
- Font Style:
  Draft
  NLQ Vintage 12
  NLQ Script
  Condensed
  Sub/Superscript
- Dimensions:
  1.97" (H) x 6.5" (D) x 10.8" (W)
  5cm (H) x 16.49cm (D) x 27.41cm (W)
- Weight:
  3.10 lbs. 1.4 Kilograms.
  3.75 lbs. (1.7 Kilograms)
  with 5 rechargeable batteries
- 120 VAC or battery operation
  220 - 240 VAC (European)
- Epson/IBM Compatability
- Interfaces:
  Centronics 8 bit parallel or
  RS232C 7/8 bit.serial

DICONIX
A Kodak Company
3100 Research Boulevard
Dayton, Ohio 45420.

In the U.S., for the dealer nearest you, call 1-800-DICONIX Telex: 288-280
In Europe, for the distributor nearest you, call (4121) 37 56 04
Telex: 454-199 TXC CH

See us at Comdex Spring, Booth 1452.

[illegible] Co IS02710

we never stop asking "What if..."

Order HP Workstations. Save $1.89.

Bundled PC Workstation Solutions from Hewlett-Packard.

Buying workstations can be quite a headache.

Evaluating people's needs, surveying available components, ordering, testing and supporting them can turn into a time-consuming hassle.

But because we monitor the way people work with PCs, we've learned to configure and package—bundle together—the most efficient hardware/software combinations for the job.

Our HP Vectra PC workstations come specifically configured for secretarial, professional or desktop publishing needs.

They work in a networked environment. As your needs grow, they can be upgraded.

They're all IBM AT-compatible, and they're all available now.

So to choose the right workstations, all you have to choose is HP.

It's one more example of how the company that never stops asking "What if..." makes life easier and more productive for you. Call 1 800 367-4772, Dept. 282Y.

hp HEWLETT PACKARD

Too often a top-rated reputation can
be overshadowed by misconception.

You can now get a top-rated stat mux from Codex for as little as $1,250.

These days anything that comes with the top rating in its field also comes with the perception that it's very expensive.

And while that's true of many things from cars to clothing, it's not true of statistical multiplexers. Because while both the 1986 *Data Communications* survey and the Market Information Center's 1986 Multiplexer Market Study rated Codex number one overall, you can get one of our economical stat muxes for as little as $1,250.

So now companies of all sizes can get the quality, reliability, and ease of use that Codex is famous for. With the same support and service we offer even the largest networks.

These economical stat muxes are designed to improve the operational efficiency of smaller networks by merging the information from up to 16 synchronous or asynchronous devices. They're incredibly easy to use, provide error-free transmission, and can save you money on line costs whether you're working with a simple point-to-point configuration, or tying into a larger network.

To find out about Codex 6000 Series stat muxes, call **1-800-426-1212, Ext. 235**. Or write Codex Corporation, Dept. 707-35, 7 Blue Hill River Road, Canton, MA 02021-1097. You'll discover when you talk to Codex, high quality doesn't mean high prices.

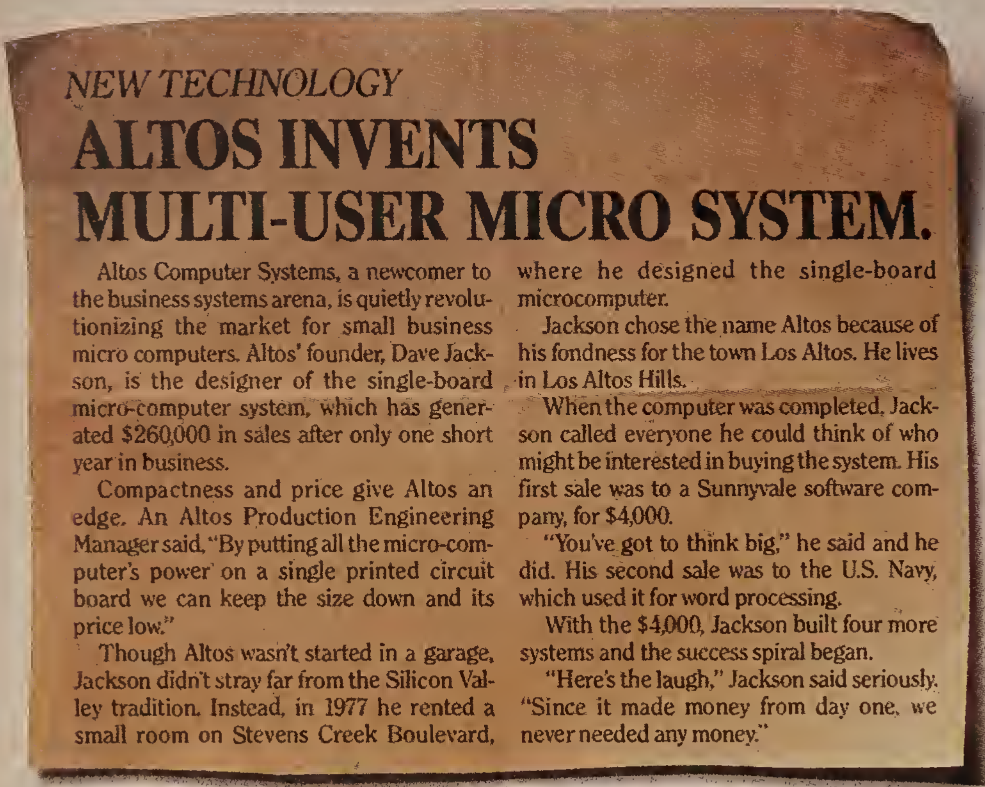
The Codex 6015 supports 16 devices.
The Codex 6003 supports 8 devices.

codex
Ⓜ MOTOROLA
The Networking Experts

Sales offices in more than 40 countries worldwide. In Europe call 32-2-6608980, in Canada call 416-793-5700, in the Far East 852-5-666706, (in Japan 81-3-5848101), in the Americas 617-364-2000.
© 1987 Codex Corporation. Motorola and Ⓜ are trademarks of Motorola, Inc. Codex is a registered trademark of Codex Corporation.

Visit Codex at NOAC booth #535-41, May 31-June 2.

It may be the bigg
multi-user industry
it's busines



NEW TECHNOLOGY

ALTOS INVENTS MULTI-USER MICRO SYSTEM.

Altos Computer Systems, a newcomer to the business systems arena, is quietly revolutionizing the market for small business micro computers. Altos' founder, Dave Jackson, is the designer of the single-board micro-computer system, which has generated $260,000 in sales after only one short year in business.

Compactness and price give Altos an edge. An Altos Production Engineering Manager said, "By putting all the micro-computer's power on a single printed circuit board we can keep the size down and its price low."

Though Altos wasn't started in a garage, Jackson didn't stray far from the Silicon Valley tradition. Instead, in 1977 he rented a small room on Stevens Creek Boulevard, where he designed the single-board microcomputer.

Jackson chose the name Altos because of his fondness for the town Los Altos. He lives in Los Altos Hills.

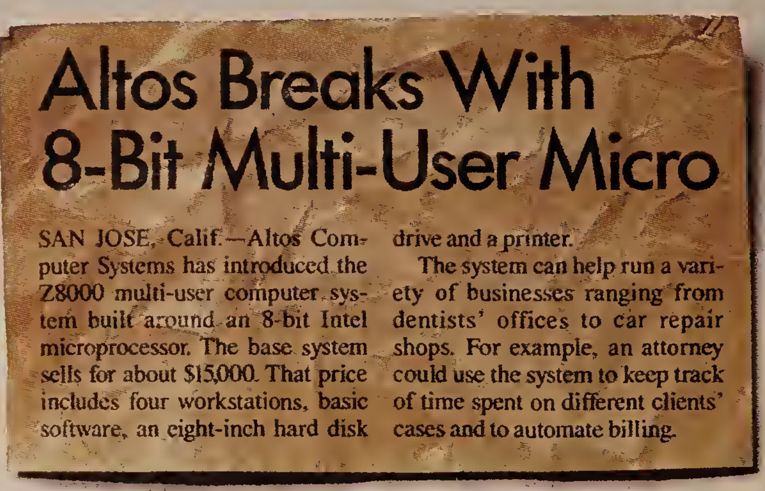
When the computer was completed, Jackson called everyone he could think of who might be interested in buying the system. His first sale was to a Sunnyvale software company, for $4,000.

"You've got to think big," he said and he did. His second sale was to the U.S. Navy, which used it for word processing.

With the $4,000, Jackson built four more systems and the success spiral began.

"Here's the laugh," Jackson said seriously. "Since it made money from day one, we never needed any money."

1978

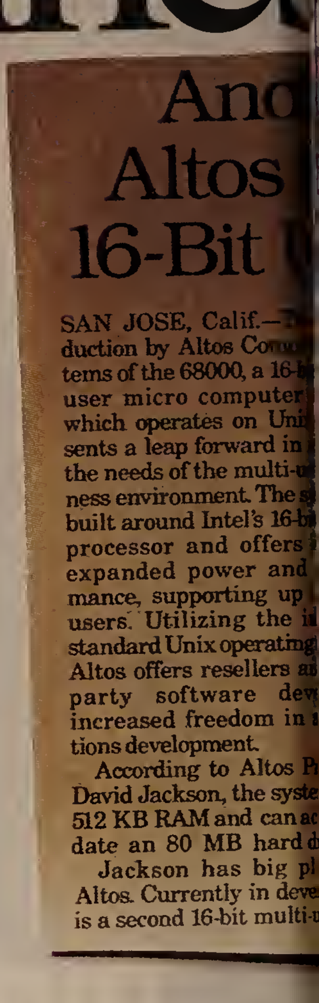


Altos Breaks With 8-Bit Multi-User Micro

SAN JOSE, Calif.—Altos Computer Systems has introduced the Z8000 multi-user computer system built around an 8-bit Intel microprocessor. The base system sells for about $15,000. That price includes four workstations, basic software, an eight-inch hard disk drive and a printer.

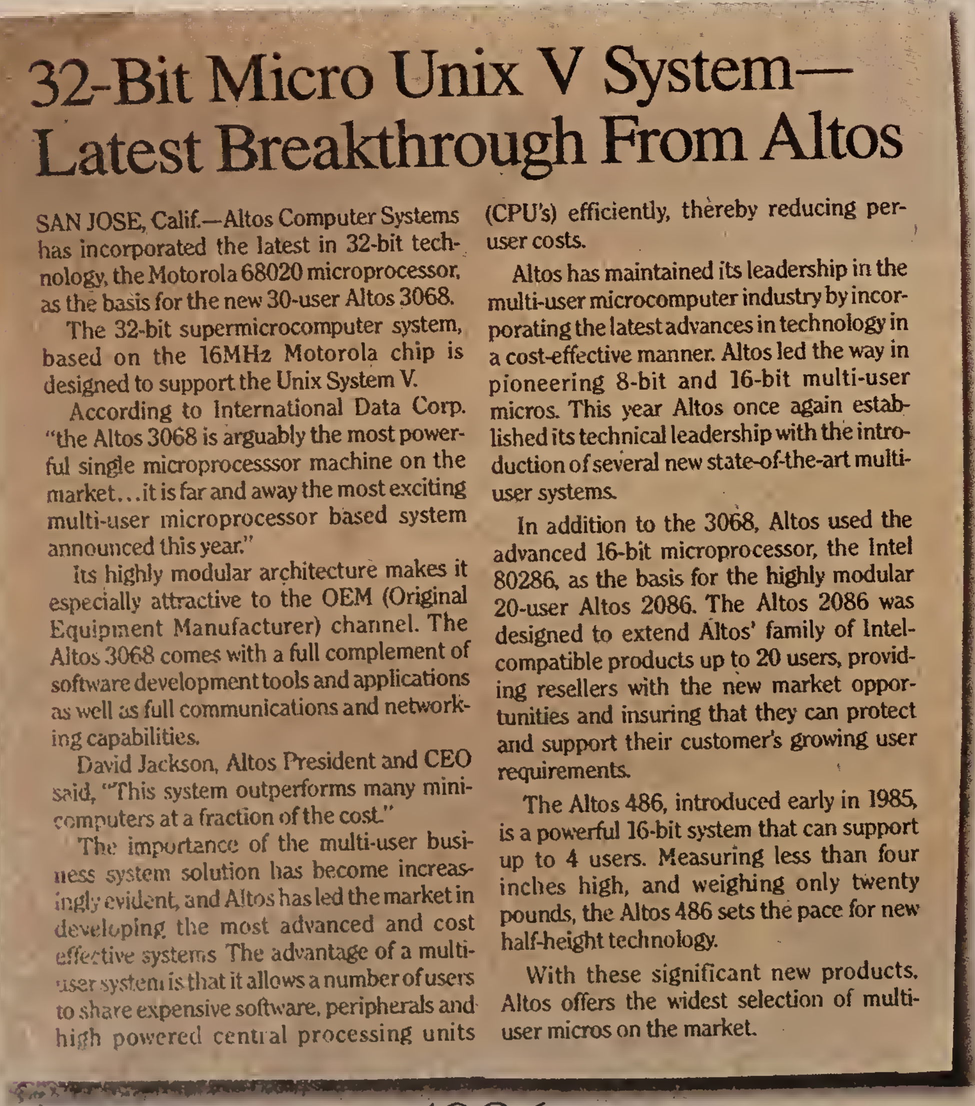
The system can help run a variety of businesses ranging from dentists' offices to car repair shops. For example, an attorney could use the system to keep track of time spent on different clients' cases and to automate billing.

1980



Ano
Altos
16-Bit

SAN JOSE, Calif.—
duction by Altos Com
tems of the 68000, a 16-
user micro computer
which operates on Uni
sents a leap forward in
the needs of the multi-
ness environment. The
built around Intel's 16-b
processor and offers
expanded power and
mance, supporting up
users. Utilizing the i
standard Unix operating
Altos offers resellers a
party software dev
increased freedom in
tions development.
According to Altos P
David Jackson, the syste
512 KB RAM and can ac
date an 80 MB hard d
Jackson has big pl
Altos. Currently in deve
is a second 16-bit multi-



32-Bit Micro Unix V System— Latest Breakthrough From Altos

SAN JOSE, Calif.—Altos Computer Systems has incorporated the latest in 32-bit technology, the Motorola 68020 microprocessor, as the basis for the new 30-user Altos 3068.

The 32-bit supermicrocomputer system, based on the 16MHz Motorola chip is designed to support the Unix System V.

According to International Data Corp. "the Altos 3068 is arguably the most powerful single microprocesssor machine on the market...it is far and away the most exciting multi-user microprocessor based system announced this year."

Its highly modular architecture makes it especially attractive to the OEM (Original Equipment Manufacturer) channel. The Altos 3068 comes with a full complement of software development tools and applications as well as full communications and networking capabilities.

David Jackson, Altos President and CEO said, "This system outperforms many minicomputers at a fraction of the cost."

The importance of the multi-user business system solution has become increasingly evident, and Altos has led the market in developing the most advanced and cost effective systems The advantage of a multi-user system is that it allows a number of users to share expensive software, peripherals and high powered central processing units (CPU's) efficiently, thereby reducing per-user costs.

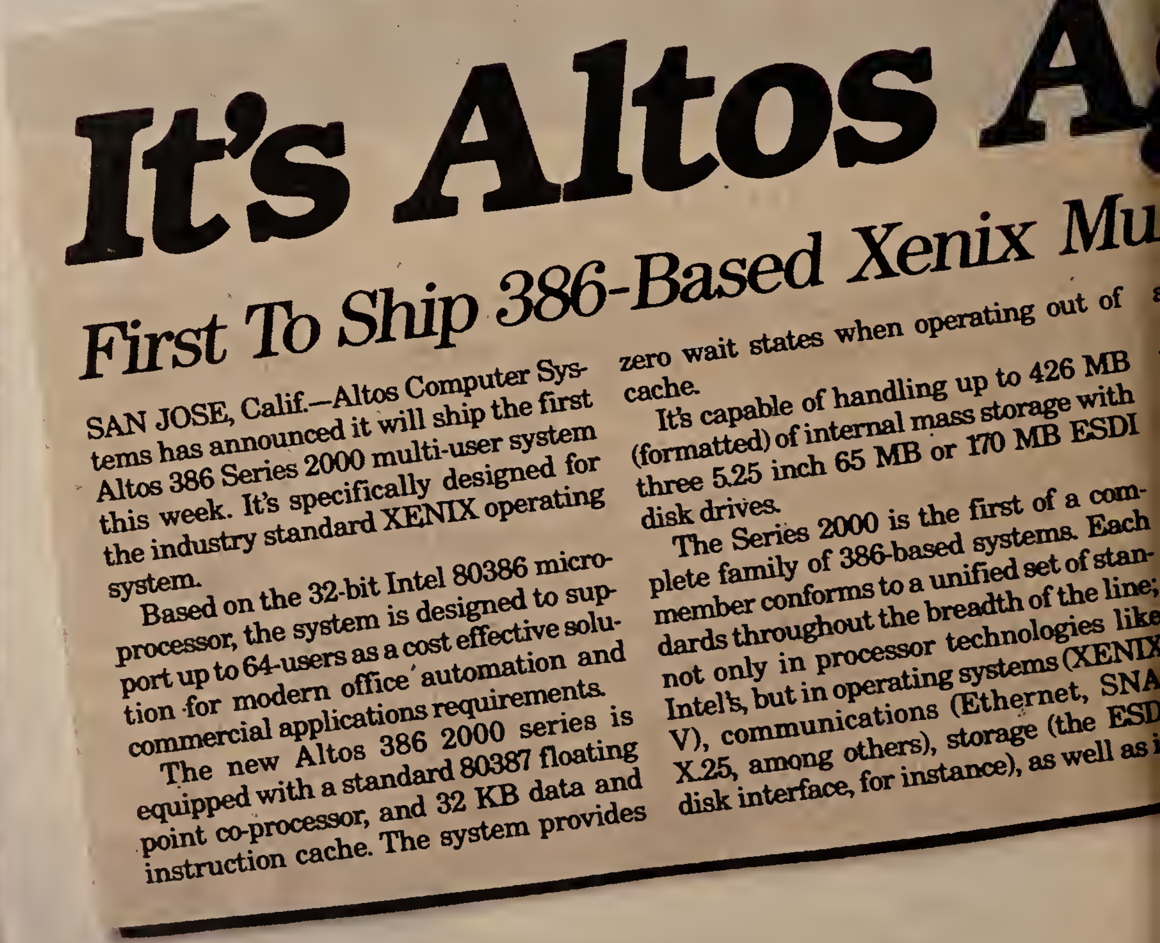
Altos has maintained its leadership in the multi-user microcomputer industry by incorporating the latest advances in technology in a cost-effective manner. Altos led the way in pioneering 8-bit and 16-bit multi-user micros. This year Altos once again established its technical leadership with the introduction of several new state-of-the-art multi-user systems.

In addition to the 3068, Altos used the advanced 16-bit microprocessor, the Intel 80286, as the basis for the highly modular 20-user Altos 2086. The Altos 2086 was designed to extend Altos' family of Intel-compatible products up to 20 users, providing resellers with the new market opportunities and insuring that they can protect and support their customer's growing user requirements.

The Altos 486, introduced early in 1985, is a powerful 16-bit system that can support up to 4 users. Measuring less than four inches high, and weighing only twenty pounds, the Altos 486 sets the pace for new half-height technology.

With these significant new products, Altos offers the widest selection of multi-user micros on the market.

1986



It's Altos A

First To Ship 386-Based Xenix Mu

SAN JOSE, Calif.—Altos Computer Systems has announced it will ship the first Altos 386 Series 2000 multi-user system this week. It's specifically designed for the industry standard XENIX operating system.

Based on the 32-bit Intel 80386 microprocessor, the system is designed to support up to 64-users as a cost effective solution for modern office automation and commercial applications requirements.

The new Altos 386 2000 series is equipped with a standard 80387 floating point co-processor, and 32 KB data and instruction cache. The system provides zero wait states when operating out of cache.

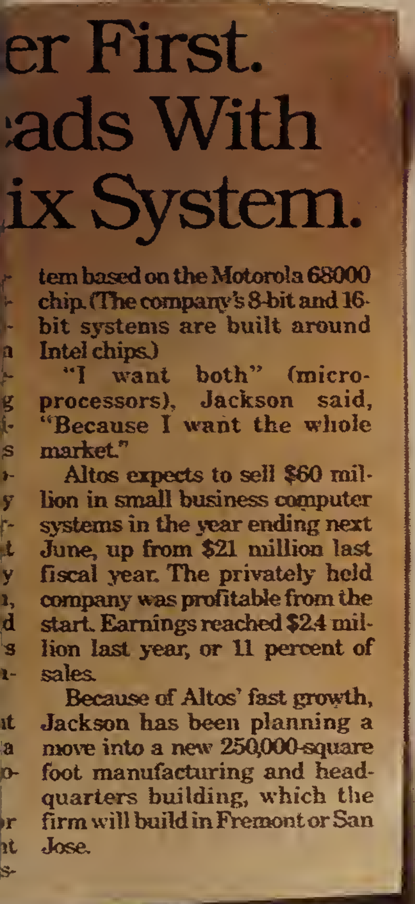
It's capable of handling up to 426 MB (formatted) of internal mass storage with three 5.25 inch 65 MB or 170 MB ESDI disk drives.

The Series 2000 is the first of a complete family of 386-based systems. Each member conforms to a unified set of standards throughout the breadth of the line; not only in processor technologies like Intel's, but in operating systems (XENIX V), communications (Ethernet, SNA X.25, among others), storage (the ESD disk interface, for instance), as well as i

1987

©1987 Altos Computer Systems

est news to hit the
in 10 years, but to us
s as usual.



er First.
ads With
ix System.

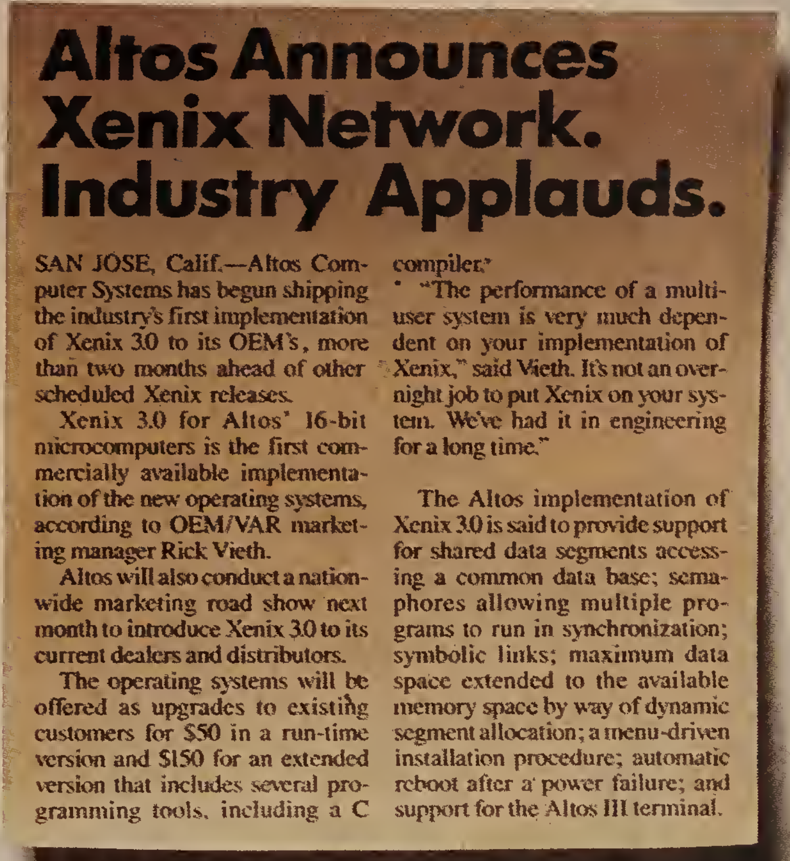
tem based on the Motorola 68000 chip. (The company's 8-bit and 16-bit systems are built around Intel chips.)

"I want both" (microprocessors), Jackson said, "Because I want the whole market."

Altos expects to sell $60 million in small business computer systems in the year ending next June, up from $21 million last fiscal year. The privately held company was profitable from the start. Earnings reached $2.4 million last year, or 11 percent of sales.

Because of Altos' fast growth, Jackson has been planning a move into a new 250,000-square foot manufacturing and headquarters building, which the firm will build in Fremont or San Jose.

982



Altos Announces Xenix Network. Industry Applauds.

SAN JOSE, Calif.—Altos Computer Systems has begun shipping the industry's first implementation of Xenix 3.0 to its OEM's, more than two months ahead of other scheduled Xenix releases.

Xenix 3.0 for Altos' 16-bit microcomputers is the first commercially available implementation of the new operating systems, according to OEM/VAR marketing manager Rick Vieth.

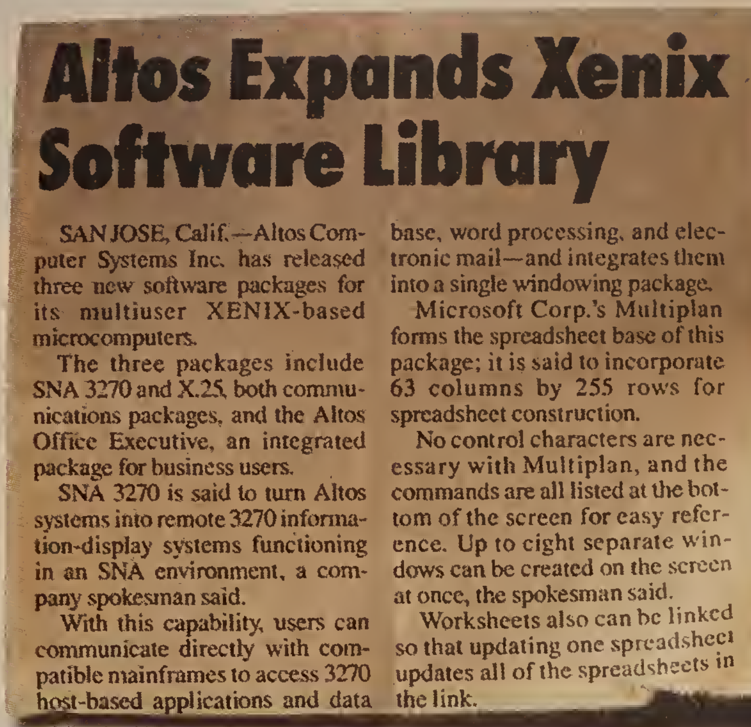
Altos will also conduct a nationwide marketing road show next month to introduce Xenix 3.0 to its current dealers and distributors.

The operating systems will be offered as upgrades to existing customers for $50 in a run-time version and $150 for an extended version that includes several programming tools, including a C compiler.

"The performance of a multiuser system is very much dependent on your implementation of Xenix," said Vieth. It's not an overnight job to put Xenix on your system. We've had it in engineering for a long time."

The Altos implementation of Xenix 3.0 is said to provide support for shared data segments accessing a common data base; semaphores allowing multiple programs to run in synchronization; symbolic links; maximum data space extended to the available memory space by way of dynamic segment allocation; a menu-driven installation procedure; automatic reboot after a power failure; and support for the Altos III terminal.

1983



Altos Expands Xenix Software Library

SAN JOSE, Calif.—Altos Computer Systems Inc. has released three new software packages for its multiuser XENIX-based microcomputers.

The three packages include SNA 3270 and X.25, both communications packages, and the Altos Office Executive, an integrated package for business users.

SNA 3270 is said to turn Altos systems into remote 3270 information-display systems functioning in an SNA environment, a company spokesman said.

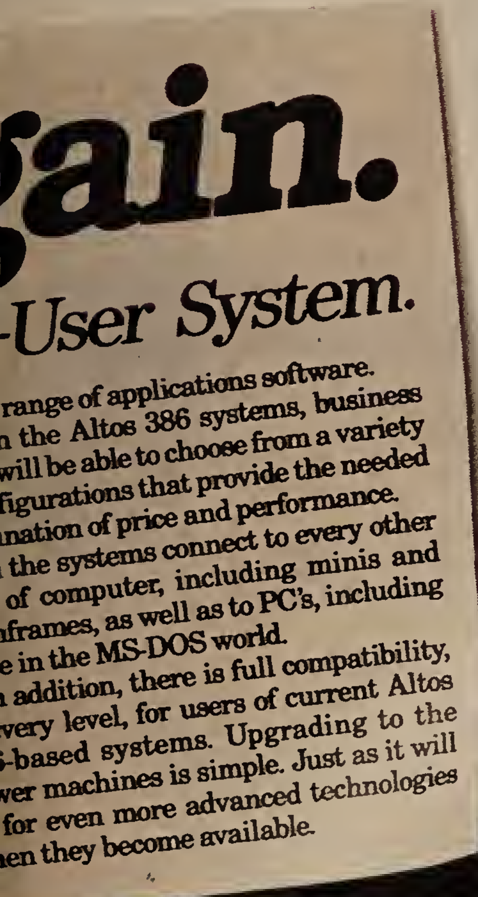
With this capability, users can communicate directly with compatible mainframes to access 3270 host-based applications and data base, word processing, and electronic mail—and integrates them into a single windowing package.

Microsoft Corp.'s Multiplan forms the spreadsheet base of this package; it is said to incorporate 63 columns by 255 rows for spreadsheet construction.

No control characters are necessary with Multiplan, and the commands are all listed at the bottom of the screen for easy reference. Up to eight separate windows can be created on the screen at once, the spokesman said.

Worksheets also can be linked so that updating one spreadsheet updates all of the spreadsheets in the link.

1984



ain.
-User System.

range of applications software.
n the Altos 386 systems, business
will be able to choose from a variety
figurations that provide the needed
nation of price and performance.
the systems connect to every other
of computer, including minis and
frames, as well as to PC's, including
e in the MS-DOS world.
addition, there is full compatibility,
very level, for users of current Altos
-based systems. Upgrading to the
ver machines is simple. Just as it will
for even more advanced technologies
en they become available.

For a decade, Altos has been a growing force in the computer business with a series of industry firsts.

Now, that leadership continues.

Introducing the Altos 386 Series 2000, the first in our family of powerful new 80386 based systems.

It's capable of handling 64 users with 3 to 5 times more power than any multi-user system we've ever offered. But power is only part of the story.

The Series 2000 is designed to provide new standards in connectivity. Expandability. Modularity. And growth potential. So it will easily accommodate new technology, and work with existing software.

When it comes to service, the new Altos 386 Series 2000 offers the option of a unique remote diagnostic program that allows off-site inspection of down components. Fully modular design and construction provides greatly simplified on-site repair and replacement capability.

Best of all, the new 386 Series 2000 is based on Altos multi-user technology that has been perfected over 10 years. So it comes with the bugs worked out.

For VARs and OEMs, the new Altos 386 Series 2000 not only offers the power, price, features and connectivity your customers demand, it also gives you Altos flexibility, commitment to your marketing channel, and impressive profit margins.

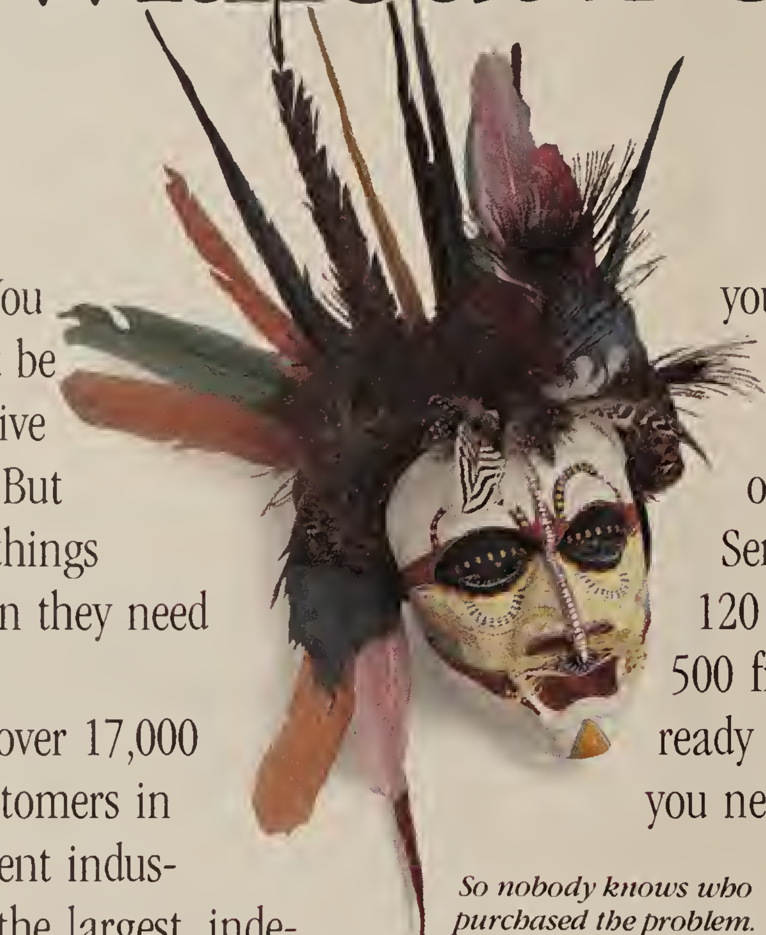
Call us about the new Altos Series 2000 today. We'll give you all the news on the biggest innovation to hit the computer business in years.

Even though it's an everyday thing to us.

ALTOS
COMPUTER SYSTEMS®

For more information call 1-800-ALTOS-US or write to Altos Computer Systems, 2641 Orchard Parkway, San Jose, CA 95134.

How to survive your S/3X without Decision Data.



So nobody knows who purchased the problem.

Don't Worry.
We're Compatible.

You should have worried.

Alright. You might be able to survive without us. But why make things tougher than they need to be?

With over 17,000 satisfied customers in many different industries, we're the largest, independent, worldwide supplier of compatible peripherals for the System/36, /38 *and* /34. But our experience with–and commitment to–the S/3X marketplace extends well beyond individual products to total systems solutions and support.

When you work with us, you work with a Decision Data representative who knows our products inside out; who takes a personal interest in your business and your needs; and who specializes in giving you more for less.

You get direct support from our own Decision Data Service, Inc. with 120 locations and over 500 field engineers ready to help when you need them.

You get products backed by an annual R&D investment of nearly $9,000,000 to ensure complete compatibility and outstanding price/performance features; products that are proven reliable by countless, rigorous testing procedures.

And you get the kind of product selection that results in the most successful solutions. Our product family includes everything from matrix, band and laser printers to multi-user systems, ergonomically designed terminals and personal workstation systems for decision support applications. Even memory enhancements and uninterruptible power supplies.

All of which means when your solution includes Decision Data, you can feel very comfortable knowing you'll never have to mask your decision. Ever.

For more information,
simply call
1-800-523-6529,
or in PA,
(215) 757-3322.
In Canada, call
(416) 273-7161.

In case your supplier does not supply service.

Decision
Data
Computer
Corporation
A **Decision Industries** Company

COMPATIBLES ENGINEERED TO SURVIVE THE FUTURE.

© 1987, Decision Data Computer Corporation. 400 Horsham Rd., Horsham, PA 19044-0996

COMPUTERWORLD. It's indispensable!

Please enter my subscription to COMPUTERWORLD at the low Special Introductory Rate of just *$38.95 for 51 issues, a savings of $5 off the basic rate! Plus, I'll receive all 12 COMPUTERWORLD FOCUS issues at no extra charge.

☐ Bill me. ☐ Payment enclosed. Address Shown: ☐ Home ☐ Business

FIRST NAME M I LAST NAME

* U.S. only.

TITLE

COMPANY

ADDRESS

CITY STATE ZIP

1. **BUSINESS/INDUSTRY** (Circle one)
   10 Manufacturer (other than computer)
   20 Finance/Insurance/Real Estate
   30 Medicine/Law/Education
   40 Wholesale/Retail/Trade
   50 Business Service (except DP)
   60 Government--State/Federal/Local
   65 Public Utility/Communications Systems/Transportation
   70 Mining/Construction/Petroleum/Refining/Agriculture
   80 Manufacturer of Computers, Computer-Related Systems or Peripherals
   85 Computer Service Bureau/Software/Planning/Consulting
   90 Computer/Peripheral Dealer/Distributor/Retailer
   75 User Other ______
   95 Vendor Other ______
   (Please specify)

2. **TITLE/FUNCTION** (Circle one)
   IS/MIS/DP MANAGEMENT
   19 Vice President, Asst VP
   21 Dir , Mgr , Suprv , IS/MIS/DP Services
   22 Dir., Mgr , Suprv , of Operations, Planning, Adm. Services
   23 Dir , Mgr , Suprv , Analyst, of Systems
   31 Dir , Mgr., Suprv , of Programming
   32 Programmer, Methods Analyst
   35 Dir., Mgr., Suprv , OA/WP
   38 Data Comm Network/Systems Mgt
   OTHER COMPANY MANAGEMENT
   11 President, Owner/Partner, General Mgr
   12 Vice President/Asst VP
   13 Treasurer, Controller, Financial Officer
   ENGINEERING
   41 Engineering Scientific, R & D, Tech. Mgt.
   SALES
   51 Manufacturing Sales Reps , Sales/Mktg Mgt
   OTHER PROFESSIONALS
   60 Consulting Mgt
   70 Medical, Legal, Accounting Mgt.
   80 Educators, Journalist, Librarians, Students
   90 Others ______
   (Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
   Types of equipment with which you are personally involved either as a user, vendor, or consultant
   A Mainframes/Superminis
   B Minicomputers/Small Business Computers
   C Microcomputers/Desktops
   D Communications Systems
   E. Office Automation Systems
   F No Computer Involvement

3313-CA

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY ADDRESSEE

COMPUTERWORLD

CIRCULATION DEPARTMENT
BOX 1016
SOUTHEASTERN, PA 19398-9984

SYSTEMS & PERIPHERALS

HARD TALK

Richard Mikita

A path of dual standards

Computer vendors have successfully infected the collective unconscious with silicon dreams and fiber-optic fantasies, one of which goes something like this:

In the first millennium there was the modem. In the next, the network. In the dawning third age, we will see distributed resource sharing at the work group, departmental and corporate levels; the promised "LAN" of the all-points-accessible information system.

Big business looks to IBM and Digital Equipment Corp. to lead the way, leaving small businesses largely to their value-added resellers and competitors.

So let's give Big Blue and No. 2 the third of the small-systems market they have held for the past few years and look at what is happening elsewhere, among the un-Fortune-ate 5,000, where price and tailored fit are more important than pedigree.

The closest thing to commonality within this group of entrepreneurial irregulars is the desire to get on with business and to avoid getting bogged down by swollen inventories, senseless bureaucracy or cash-hungry computers.

Continued on page 72

Physicians heal own MIS woes

Chicago surgeons outstep MIS, buy Sequent unit to automate operations

BY JEAN S. BOZMAN
CW STAFF

CHICAGO — When surgeons at Rush-Presbyterian-St. Luke's Medical Center wanted to automate the reporting of surgical procedures, they did not turn to MIS. Instead, they did what many end users have done: They bought their own solution.

In this case, though, the machine that users chose on their shopping expedition was not an IBM Personal Computer or a Digital Equipment Corp. Microvax. It was a Sequent Computer Systems, Inc. Balance 21000, a superminicomputer with a power rating of 4.5 million instructions per second (MIPS), expandable to 22 MIPS.

The Balance 21000 — installed last month with six CPU boards, 10M bytes of main memory and support for 64 users — was purchased as the prime engine for a Unix-based surgical-care information system. It is housed in a linoleum-tiled former pathology lab, without a raised floor or other standard accoutrements of a modern computer room. The room measures only 11½ by 14½ feet.

The processor, which lists for nearly $200,000, was purchased in December for about $170,000 by the surgical staff at Rush-Presbyterian without the approval of its IBM-oriented MIS team. Other machines at the hospital, such as DEC VAX computers, were purchased outside of MIS but had MIS approval. The surgeons' new system is one of an estimated 60 Balance 21000s installed worldwide.

The Sequent sale is the latest step in a move toward decentralization in computing at the Chicago medical center.

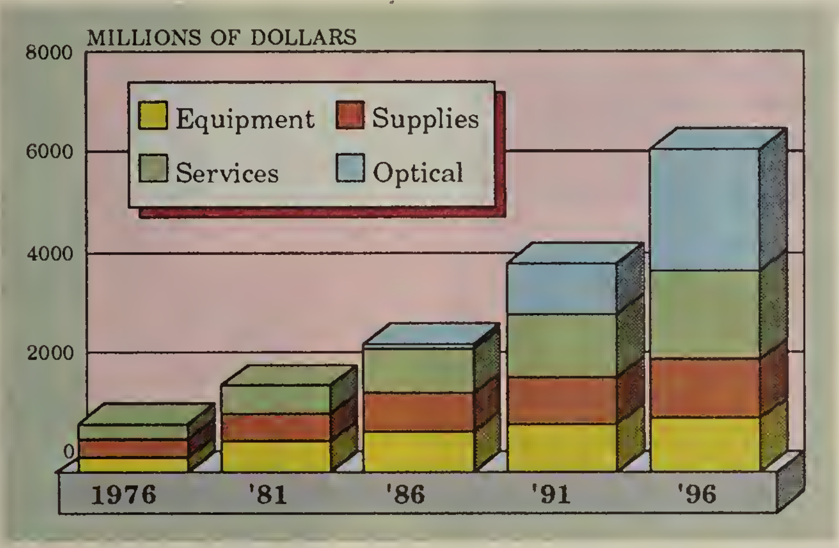
The MIS staff has been monitoring the Sequent system's acquisition, but only from afar. "Our involvement has really

Continued on page 70

Data View

Expanding images

Optical storage and services fuel information and image management industry growth



INFORMATION PROVIDED BY THE ASSOCIATION FOR INFORMATION AND IMAGE MANAGEMENT
CW CHART: SUSAN ALDAM

Terminal shifts to fit

BY DAVID BRIGHT
CW STAFF

FREMONT, Calif. — Link Technologies, Inc. this week is expected to announce a display terminal that features hardware modularity and what the company calls an "elegant" ergonomic design.

Priced at $595, the 14-in. MC10 is positioned as an ASCII and ANSI terminal and also as a component in vertical-market configurations. The unit can simultaneously be connected to multiple host computers that use

Continued on page 71

Arete adds entry-level multi-CPU

BY STANLEY GIBSON
CW STAFF

SAN JOSE, Calif. — Adding to the low end of its product line, Arete Systems Corp. recently brought out the Arete 800, a 16-user multiprocessor for on-line commercial applications.

Arete claimed the 800 model provides three times the performance of an NCR Corp. Tower 32/800 at half the price.

The multiuser computer includes two 12.5-MHz Motorola, Inc. 68020 processors and is priced from $38,000. Arete said it will also sell a single-processor version for less than $30,000.

The 800 model is compatible with the current Arete family, which includes Models 900, 1200 and 1600. The Model 1600 can handle up to 20 transaction/sec. and can support up to 128 users, the vendor said.

"The Arete 800 is an entry-level product that provides the flexibility and expansion capacity to accommodate users' increasing computing needs," said Doug

Continued on page 72

Inside

- TI announces symbolic processing workstation configurations. Page 74.
- Clearpoint designs memory upgrades for IBM RT PC. Page 74.

▶ IBM 3270 and System /34/36/38 Users:

Our Printers Solve Problems That IBM Printers Can't.

▶ Since 1975, we have manufactured IBM 3270 and S/3X plug-compatible printers for over 1,000 organizations worldwide. Why do users prefer ISI? Mainly, because our printers have problem-solving capabilities not available with corresponding IBM models.

For example, with ISI printers, you can:
- ▶ Print continuous, multi-part forms without costly waste.
- ▶ Print bar codes and oversize label characters.
- ▶ Print up to 8 pages of letter-quality text per minute.
- ▶ Print IBM Programmed Symbols graphics in up to 7 colors.

Added features and all, our printers cost 15-30% less than their IBM counterparts.

Select from desktop dot matrix, laser, and letter-quality impact models, as well as floor-standing line printers. No need for boxes — our printers are fully integrated. Plus they're shop-floor durable, and feature onsite service nationwide.

For our free brochure, call **1-800-544-4072** (in Michigan, 313/769-5900). Or write.

Interface Systems, Inc.
5855 Interface Drive, Ann Arbor, MI 48103
Telex: 810-223-6058

▶ The ISI 487, our 200 cps replacement for the IBM 3287, prints NLQ, bar codes, and oversize label characters — all with forms-saving demand-document efficiency. S/3X users get the same capabilities with our ISI 424, which replaces the IBM 5256 and 4214-2.

Physicians

FROM PAGE 69

been postdecision," says Walter Menning, associate vice-president for data processing at Rush-Presbyterian. "There had been some discussion about the need for a surgical support system, but I know nothing about it in terms of its requirements or definition."

According to Dr. David Roseman, a senior attending surgeon at Rush-Presbyterian who acts as medical director of Surgical Information Systems, the machine was acquired for its reliability, its Unix capability and its promise. Roseman has been a longtime advocate of computer technology in medicine, tracing his interest in technology to a 1968 experiment that monitored intensive care patients with a DEC PDP-8.

The Surgical Information Systems software that the Balance 21000 will run was designed to automate the recording of surgical activities carried out in Rush-Presbyterian's 24 operating rooms. Each surgery — there are 70 to 100 a day — requires specific lists of medical tools, supplies and prescription drugs. As surgery proceeds, each step is noted on paper by a circulating nurse, and the head surgeon later makes a written report. The paperwork is tedious, and critical data cannot be compared, doctors say.

The Sequent machine's purchase followed several years of analysis into the challenge of automating the surgeries. First, a task force named the new information systems group the Surgical Information Systems, and Roseman hired two applications developers. Development of a Unix-based surgical-support solution began in 1984 with the developers working full-time on a trio of Altos Computer Systems, Inc. 1M-byte processors.

Using Unix and the Informix/SQL data base management system language from Informix Software, Inc. in Menlo Park, Calif., the developers created the system on the small Altos machines before it was tried on the Sequent processor.

Gone 'grass roots'

"The most interesting thing about the purchase is that we have gone from a top-down process to a totally grass roots and bottom-up kind of process," Roseman says. "The tools are so powerful now that the guy in the trenches can play a substantial role in developing his own solutions." The system was debugged and tested in conjunction with three of the 24 operating suites. "We had to prove ourselves before we got any funding for the project, so we built the application on the Altos machines and showed that it worked," says Sequent project manager Steven Olund.

Olund began shopping at the February 1986 Uniforum in Los Angeles and recommended the Sequent machine in March, but the purchase was delayed until December, while other machines were reviewed. More than 25 Unix machines were compared and priced, but Sequent's appeared to be the best machine for the task, Olund says.

The Balance 21000 was installed on May 19, after spending five months in a crate.

Prepping computer room

Rush-Presbyterian took early delivery to take advantage of a discount, but the computer room was not ready until last month, when an air-conditioning unit was added.

The first application to run was a surgery-billing solution called Charge. Roseman says he expects to gather a wealth of information on patient care, surgical standards and inventory control when full production starts in the fall. Applications for operation scheduling, record keeping and the receipt of pathology reports will then run. "The goal is that the data should be entered once, and only once, and it should be entered by the people who do the procedures," Roseman says.

The surgical-support system now consists of a series of screens, prepared by systems administrator Roger Allen, that automate most surgical paper reports. They record the number of scalpels and sponges used during a procedure and allow surgeons to account for all. The next step is to expand the degree

THREE NEW WAYS TO ACHIEVE PERSONAL POWER.

INTRODUCING THE APC IV FAMILY OF

POWERMATE 1. AT-class power and performance in a package that only takes up a little over a square foot of desk space. The ideal choice for all standard applications such as word processing, spreadsheet analysis and accounting. Yet flexible enough for more specialized applications such as desktop publishing, CAD/CAM and scientific modeling. A wide range of monitor, graphics board and memory options let you tailor a system to your particular needs. And unlike most systems its size, PowerMate 1 has three internal storage slots, six disk drive options and the ability to use 5¼" and 3½" drives so you can exchange data with laptops.

POWERMATE 2. If you do CAD/CAM, scientific modeling, heavy-duty data management, advanced financial modeling or presentation graphics, this system will take you as far as you want to go. Two software-selectable speeds of 8 and 10 MHz and a wide range of monitor, graphics boards and memory options make it easy to put together the ideal configuration for your needs. For example, couple it with the popular NEC MultiSync™ color monitor option for the finest graphics resolution available on any PC today.

of automation and to enter the data into a relational data base built with Informix/SQL and Informix/4GL, a fourth-generation development language.

In general, departments at Rush-Presbyterian have enjoyed more autonomy in computing in recent years. Many of them have purchased IBM PCs with departmental funds rather than ask MIS to run an application on the hospital's mainframes, says Gordon Bass, associate administrator of surgical sciences and services.

"As computing became less expensive, it became easier for departments to acquire PCs with monies they received in grants," he adds.

Several departments bought VAX minicomputers for statistical analysis and preparation of lab reports.

"We allowed decentralized computing in a vacuum until about 18 months ago, when we made the decision to add the AT&T Information Systems Network," Bass says.

The network's data switch processors and concentrators will link data bases in the three primary Rush-Presbyterian buildings.

The AT&T network may be an MIS foothold in the Sequent operation. "We've only now gotten involved from the standpoint of how the Sequent machine will communicate with other machines here," Menning says.

The Sequent data base could use patient-care and financial information stored under the Patient Care Information System (PCIS) from Shared Medical Systems, Inc. in Melbourne, Pa., supported on the IBM mainframes, he says.

The Balance 21000 installation came as MIS was planning a June move into a new building devoted to MIS operations. The facility, across a highway from the Rush-Presbyterian complex, will house several IBM mainframes and Tandem Computers, Inc. machines that act as front ends for those mainframes.

Now that the Sequent is running, MIS would like to meet with the surgical-care support group, Menning says. But Menning's staff is not sure how they will approach the problem of communicating with the group across the highway.

"It's there. We know it's there," says Menning of the Sequent computer. "But we don't know our role in managing it."

Terminal

FROM PAGE 69

different protocols, according to the company.

The terminal can be configured to specific requirements through two cartridge options, one for keyboards and one for other features. Connected to a cord at the back of the keyboard, the keyboard cartridge plugs into the side of the terminal, thereby changing the characteristics of the terminal.

Two types of keyboards and modules are currently available. One keyboard is compatible with Digital Equipment Corp.'s VT330, and the other includes compatibility with Wyse Technology, Televideo Systems, Inc. and other terminals.

The second cartridge is optional and allows the user to plug in graphics capability and a serial or parallel-printer port.

"Only 20% of people use graphics," said product planning director Harvey Ulijohn. "If you decide you want graphics, you can have the machine up and running in three minutes."

The terminal uses a clutch-and-pivot mechanism for easy screen adjustment to a wider range of positions than found on most terminals, according to Ulijohn. "The MC10 does everything the VT330 can do and has a lower price and an enclosure that is 10 times better," he claimed.

PERSONAL COMPUTERS.

BUSINESSMATE. The system for people who want a multi-user system but don't want the cost or complication of a network. In fact, for applications that need centralized processing, such as accounting, inventory control and order processing, this is the most economical and practical system you can buy. It supports up to nine work stations and accommodates as many as five internal storage devices.

C&C Computers and Communications

If you're into power, NEC has an announcement that should really get your adrenaline racing.

We've just enhanced one of the hottest AT-class PC's on the market—our Advanced Personal Computer IV, and expanded it into three powerful systems: PowerMate™ 1, PowerMate 2 and BusinessMate.™ So no matter what your needs, you can have the power to run faster. The power to dig deeper. The power to really take it to the limit—even when you're not sure what the limit is.

The APC IV,™ as you've probably read, already has the power of the press behind it. PC World called it "a screamer." And PC Magazine said, "It is muscular, stylish, very classy... everything an AT-class machine should be and then some." And Personal Computing proclaimed, "The APC IV is an impressive-looking computer... with powerful expansion capabilities and a monitor you won't want to take your eyes off."

The APC IV family has the power of NEC behind it. The power of a $13 billion leader in computers and communications. So you never have to worry about service or support.

One of our new systems has your name on it. Whether you're a dreamer driving a new mechanical design right into the stratosphere. Or an accountant projecting figures far into the future. Or part of a group that needs to work with a common data base.

The new APC IV family of computers. Because sooner or later, you're going to have to take it to the limit.

For more information and the name of the NECIS reseller nearest you, call 1-800-343-4419 (in MA 617-264-8635). Or write:
NEC Information Systems,
Dept. 1610, 1414 Massachusetts Ave.,
Boxborough, MA 01719.

Take it to the limit.

NEC
NEC Information Systems, Inc.

PROMPT
DBMS
FOR THE
IBM SERIES/1
800-626-5518
502-633-5700
EDI & APPLICATIONS TOO!

Dual standards

CONTINUED FROM PAGE 69

Stand-alone personal computers have, not surprisingly, been pressed into sweatshop service within many a small business for which breaking into the billion-dollar club is not the only dream troubling sleep. But the info-lust inspired by the marketing magic of the majors cannot long be requited by the stand-alone PC. Still, budgets may not support the big-vendor path to network nirvana.

Two forces are coming together to open an alternate path. First, price sensitivity pushes the market toward microprocessor-based systems. Second, the desire for vendor independence is moving it toward Unix.

> STAND-ALONE personal computers have been pressed into sweatshop service within many a small business for which breaking into the billion-dollar club is not the only dream troubling sleep.

These pressures, coming particularly from the small business and government sectors, have radically changed the market for small (less than $100,000) multiuser systems. Five years ago, more than 70% of the small multiuser systems sold were based on board-level proprietary processors. Today, that figure has dropped below 40%.

Notwithstanding the success of DEC's Microvax II, the move to microprocessors is fundamentally a move away from proprietary architectures. The Motorola, Inc. 68000 family dominated first but has since been eclipsed by the Intel Corp. 8000 line. Among the smallest multiuser systems ($25,000 or less), the Intel chips last year provided the power in 40% of all units shipped. In the $25,000 to $50,000 range, Motorola provided the microprocessor of choice to 18% of the market.

Microsoft Corp.'s MS-DOS didn't do it. Unix and its variants did. The added power of the Intel 80386 has made the DOS-under-Unix approach practical and will pull even more users into the Unix world, although many will hardly notice they are there. Prime Computer, Inc. became the first company to announce such a product with the introduction of the EXL 316 April 28. Since then, Altos Computer Systems, Inc., Texas Instruments, Inc. and others have announced similar systems. But the offering from Prime is of the most interest because it marks what I expect will be a trend-setting change in strategy for traditional minicomputer vendors.

The value added by Prime to the basic commodity parts of the EXL comes largely through packaging and the addition of a 64K-byte cache and a highly optimized C compiler. The value to Prime of such a system will come through sales to new-name accounts that it will gradually try to integrate into the ranks of the Series 50 faithful. This is not a strategy without risk. The Unix path means maintaining account control through good service and support, competitive pricing and performance, not through hardware and software lock-in.

The EXL 316 is a significant break for Prime from its Primos-based proprietary 50 series products and a move that the likes of Wang Laboratories, Inc. and Data General Corp. will undoubtedly need to follow if they are to remain competitive at the entry point of multiuser computing.

For those moving up to multiuser systems from stand-alone PCs as well as those unsatisfied with the traditional minicomputer economics for small workgroups, the EXL is the first — and a fine example — of a class of dual-standard (Unix/DOS) 80386-powered systems likely to become the third force in a world otherwise dominated by IBM and DEC.

Mikita is director of processor programs for International Data Corp., a Framingham, Mass.-based research organization.

Case History #60341

"Arco Petroleum Products comes to mind," said Bill Kilpatrick, of The Software Works! of Glendale, California. "It was a big project. Arco had already been through two expensive failures with other companies who could not deliver the custom software they needed. It was a Point of Sale system, a cash register interface and custom-accounting software for their entire franchised chain of convenience stores, gas stations and auto tune-up centers. It had to be done fast and it had to work. Our competition proposed a dBASE III+ solution. We proposed DataFlex. I said, 'I'll make a challenge, if we can't deliver the completed project faster using DataFlex, following the exact specifications that have already been laid out, then Arco doesn't have to pay us a dime.' We knew we could do the job right and we knew we could do it faster with DataFlex."

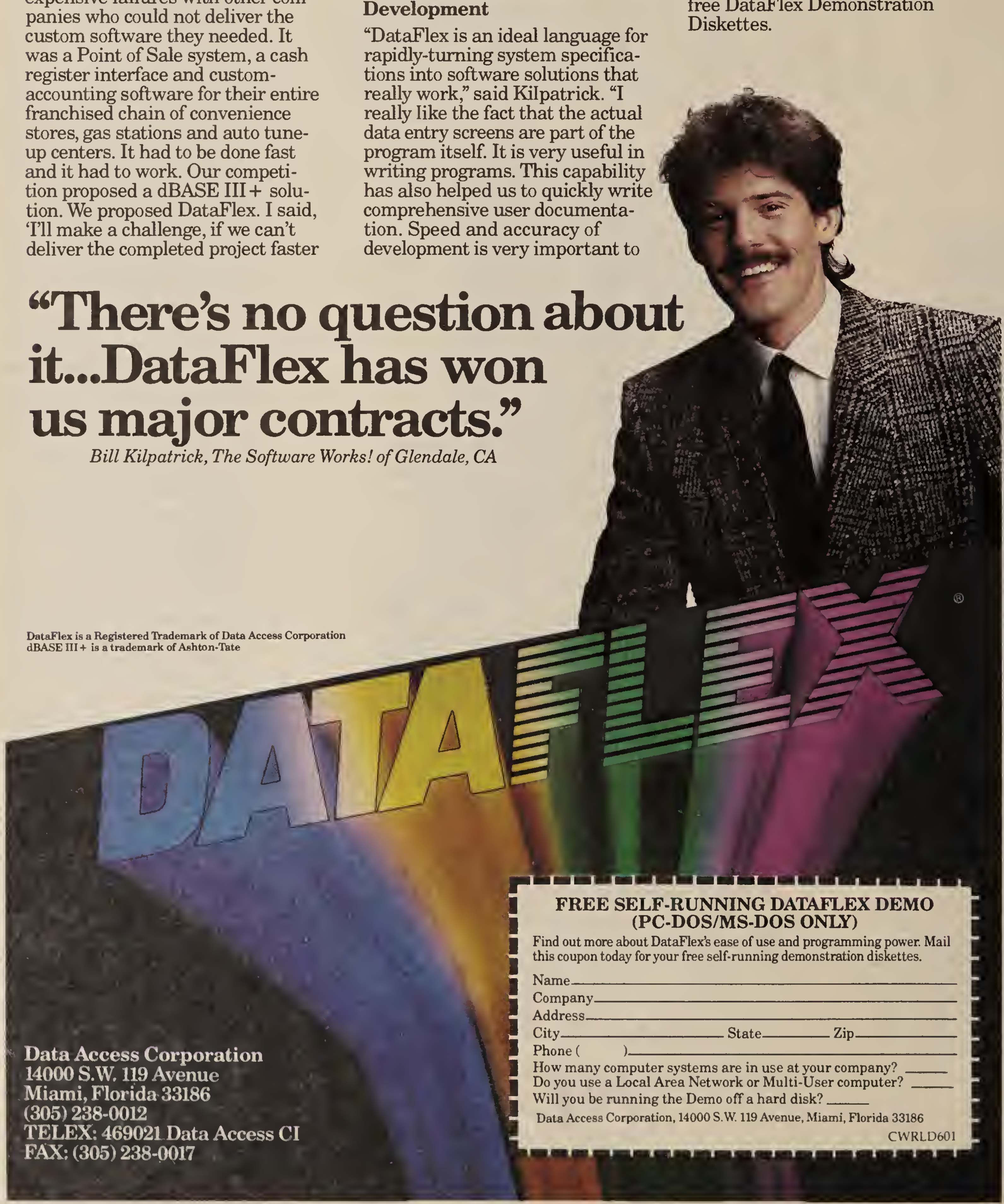
A Powerful 4GL Speeds Development

"DataFlex is an ideal language for rapidly-turning system specifications into software solutions that really work," said Kilpatrick. "I really like the fact that the actual data entry screens are part of the program itself. It is very useful in writing programs. This capability has also helped us to quickly write comprehensive user documentation. Speed and accuracy of development is very important to us. Features like the macros, the program generator and report generator enable us to do more, using less code, in a lot less time."

Take the first step to more efficient program development today. Return the coupon below for your free DataFlex Demonstration Diskettes.

"There's no question about it...DataFlex has won us major contracts."

Bill Kilpatrick, The Software Works! of Glendale, CA



DataFlex is a Registered Trademark of Data Access Corporation
dBASE III+ is a trademark of Ashton-Tate

FREE SELF-RUNNING DATAFLEX DEMO (PC-DOS/MS-DOS ONLY)

Find out more about DataFlex's ease of use and programming power. Mail this coupon today for your free self-running demonstration diskettes.

Name________
Company________
Address________
City________ State________ Zip________
Phone ( )________
How many computer systems are in use at your company? _____
Do you use a Local Area Network or Multi-User computer? _____
Will you be running the Demo off a hard disk? _____
Data Access Corporation, 14000 S.W. 119 Avenue, Miami, Florida 33186
CWRLD601

Data Access Corporation
14000 S.W. 119 Avenue
Miami, Florida 33186
(305) 238-0012
TELEX: 469021 Data Access CI
FAX: (305) 238-0017

Arete

CONTINUED FROM PAGE 69

Davis, president of Arete.

"The 800 system is ideal for on-line applications like office automation, general business and particularly transaction processing of five to 10 transactions per second," Davis added.

The 800 model uses a 5¼-in. floppy disk drive, while the other Arete models use 8-in. drives.

The 800 model runs Version 4.0 of Arix V.2, Arete's implementation of AT&T's Unix System V, Release 2.2 with selected Release 3 enhancements.

In addition to two tightly coupled applications processors, the Arete 800 system can include up to two data base processors and up to five data communications processors.

It can also include up to 16M bytes of shared memory; 5¼- and 8-in. disk technology; up to 5.5G bytes of magnetic disk storage; up to 14G bytes of optical disk storage; a 60M-byte ¼-in. streaming cartridge tape drive; and support for a variety of nine-track magnetic tape devices.

OK, SORBUS.®

Tell me more.

Let me know just what Sorbus service can do for me.

Name: ____________________

Title: ____________________

Company: ____________________

Street: ____________________

City: __________ State: ______ Zip: ______

I'm especially interested in service for the following hardware: ____________________

____

In a hurry? Call 1-800-FOR-INFO.

CW

Sorbus®
A Bell Atlantic™ Company

NEW PRODUCTS

Turnkey systems

Texas Instruments, Inc. has announced new **Explorer LX** symbolic processing workstation configurations.

The Explorer LX is a multiprocessor workstation coupling symbolic and numeric processors with a set of software tools. The Explorer LX Release 2.0 software supports the Explorer LISP processor and its software development environment. Up to 16 terminals are supported as well as other computers with terminal emulators, I/O devices or smart modems.

The base multichannel configuration includes 4M bytes of memory, a Motorola, Inc. 68020 processor with 2M bytes of memory and a communications carrier board with one eight-channel multiplexer and RS-232C connector strip.

Prices start at $55,900.

TI, P.O. Box 809063, DSG-126, Dallas, Texas 75380.

Processors

Clearpoint, Inc. has announced the **RTRAM/4** and **RTRAM/8** memory upgrades designed for the IBM Personal Computer RT.

The RTRAM/4 is said to offer 4M-byte capacity using 256K-byte dynamic random-access memory (RAM) chips. The RTRAM/8 features 8M-byte capacity using megabit dynamic RAM. Memory-cycle time is said to be 180 nsec, and access time is 100 nsec. Other features include on-board interleaving.

The RTRAM/4 costs $2,160. The RTRAM/8 costs $4,250.

Clearpoint, 99 South St., Hopkinton, Mass. 01748.

Graphics systems

GTX Corp. has announced the **GTX 5000** series drawing processor.

The processor is said to provide automatic drawing recognition. It can store drawings on a floppy disk and features an integrated-aperture card scanner with a resolution of 200 or 400 dot/in.

Other features include distributed-editing capability, the ability to convert drawing data to computer-aided design (CAD) formats, raster and optical-disk storage capabilities and the vendor's Drawing-to-CAD software.

The IBM Personal Computer AT compatible workstation-based system is priced from $69,500 to $87,500.

GTX, 2501 W. Dunlap, Phoenix, Ariz. 85021.

Data storage

Distributed Logic Corp. has announced the **DU236** disk controller for Digital Euqipment Corp.'s VAX 8650, VAX 11/730 through 11/785 and PDP-11 Unibus computers.

The controller permits the interfacing of up to four storage module device drives. Each drive may be mapped as multiple-logical units. The controller is compatible with the Mass Storage Control Protocol (MSCP) drivers and supports MSCP-compatible bad-block handling.

The DU236 is priced at $2,950.

Distributed Logic, P.O. Box 6270, 1555 S. Sinclair St., Anaheim, Calif. 92806.

Terminals

Telamon, Inc. has announced a **Console Engine** upgrade for supporting distributed or unattended Hewlett-Packard Co. HP 3000 systems.

The Console Engine is said to be able to monitor the CPU and report problems to a central support site as well as act on certain computer or program problems such as resetting the date and time after a power failure.

The Console Engine monitors the HP 3000 and dials out to send messages to a terminal or printer when it recognizes a system halt or specially formatted console message.

The Console Engine and power-supply unit cost $2,150.

Telamon, 11th Floor, 1615 Broadway, Oakland, Calif. 94612.

Application Development without Programmers?

Not in My Lifetime!

The future may bring something new, but today, businesses like yours depend on computer-based online solutions built by professional programmers. However, the tools available to your staff are—

☐ Time consuming, complex, tedious command level Cobol.
☐ Fourth Generation Languages that ask you to fit your problems to the capabilities of the product.
☐ Or bizarre, difficult, cumbersome new languages that offer outrageous productivity claims.

Only to find that any advantages are lost to an insurmountable learning curve or are offset by an extremely painful performance penalty.

That is, until now.

Goal Systems delivers **productivity *and* performance** with **Classic/AL.** The completely online development system for developing complete online applications. With **Classic/AL** you don't get—

☐ A strange language your programmers can't or won't learn.
☐ A strange development concept that doesn't fit your existing systems or methodologies.
☐ A strange pseudo-code that hogs machine cycles during execution.

Instead you get a logical Cobol-skill-based system that doesn't compromise existing standards or naming conventions. You can even utilize existing Cobol copybooks.

You get a system that executes real 370 instructions. Not some interpretive, intermediate code.

You get a single session online environment to design, prototype, develop, test, debug, and maintain real online applications. From the simplest to the most demanding of programs.

Call **800-848-4640** or write today for a free, no obligation trial and complimentary poster.

Classic/AL™

and your professional programmers. Perfect together.

CW1
Mail To: **Goal Systems International**
5455 N. High Street
Columbus, OH 43214-1193

Name ________
Title ________
Company ________
Address ________
City/State/Zip ________
Phone ( ) ________

Goal Systems
Software Solutions

Goal Systems International • 5455 N. High Street • Columbus, Ohio 43214-1193 • 800-848-4640

IN DEPTH

Do you know where your data's been?

Data encryption is reemerging as a security solution for sensitive electronic transactions

BY G. BERTON LATAMORE

Data encryption, momentarily hot in the early 1980s but considerably cooler since then, may be making a comeback. With the advent of distributed data processing and sophisticated telecommunications, data encryption is again carving a niche for itself as a data security solution.

According to the National Security Agency (NSA), in 1972 all modems operating in the U.S. together were capable of transmitting about 600,000 characters per second. By the end of this year, the agency expects enough modems will be operating in the U.S. to transmit a conglomerate 220 million characters per second. With expanding communications capabilities, cuts in the cost of computer power and increasingly sophisticated hardware and software, the growing need for data security is evident.

Some companies are beginning to wake up to the value of their data and the dangers threatening it, and in these companies, security levels are rising. For instance, Southwestern Bell Telephone Co. in St. Louis hired a separate computer-security staff responsible for providing appropriate protection — including encryption — for all its corporate data.

The reason is simple, says Gerald Grindler, systems manager for corporate computer security at Southwestern Bell. "We now consider information a formalized corporate asset," he explains. "Companies have always had security groups who were responsible for protecting other types of formalized assets like buildings, equipment and money. In today's environment, information is our most important asset because of how much we have automated our functions over the years."

A telephone company might not seem to be the kind of organization that would be burdened with large amounts of highly sensitive data. However, Grindler argues, every company maintains a great deal of private data — about employees and customers, for instance. If some of that were to fall into the wrong hands, it could prove embarrassing; in an extreme case, it might even lead to a lawsuit against the company.

Furthermore, large companies handle large amounts of money electronically, and these functions are a natural target for theft. Also, any publicly traded company must constantly reassess its stock market strategy, and, obviously, it does not want information on upcoming stock splits, buy-backs or other trading activities to fall into the wrong hands.

Slow acceptance

The use of encryption as a data security measure has been slow to gain acceptance. Observes Donn Parker, senior management consultant at SRI International in Menlo Park, Calif., "The widespread predictions of a few years ago that data encryption would become a standard practice throughout industry and that entire data bases would be encrypted to protect them from hackers turned out to be wildly overoptimistic, mainly because of the lack of a timely and real problem.

"In 17 years of collecting computer crime cases, we only have three cases of wiretapping of data communications. So it's not a problem today," he says. "There are too many easier ways to get information."

In spite of this, encryption is proving its worth in certain applications. While experts today expect large corporations will not encrypt the majority of their data because of the expense, they foresee a steady growth in the use of cryptography.

In general, encryption is being used to protect data when it leaves the normal corporate or agency DP environment, either when it is being transmitted to and from remote sites or when it is kept on micros on which password access-control methods

KEVIN POPE

- **Physical restrictions to access not enough**
- **DES, the lone commercial standard**
- **Managing a key: Who gets it and why**

Latamore is a free-lance writer based in Burlington, Vt.

are not available.

"There are specific applications where it is justified," Parker says. "Highly sensitive information such as data communications concerning corporate plans for mergers, acquisitions or litigation activities are prime candidates for encryption."

USERS STILL scribble their passwords on slips of paper and tape them to their terminals, and anybody from the president to the night cleaning crew can see them and access any data they want.

The first steps

"There are quite a few steps that should be taken first in a security program before encryption should be used," says Dennis Branstad, senior computer science fellow at the Institute for Computer Sciences and Technology, National Bureau of Standards (NBS) in Gaithersburg, Md. "[These include] having a computer security policy, security managers and risk analysis. Encryption comes about No. 17 on that list, in the commercial sector at least. In banking, it might be No. 8 or 9." Branstad is the person most responsible for the adoption of the Data Encryption Standard (DES) by the NBS and the NSA.

Unfortunately many companies have yet to take even the first steps to protect their data. "I think American industry has been almost derelict in securing information assets," says Jack Bologna, president of Computer Protection Systems, Inc. in Plymouth, Mich. "Cost/benefit analysis doesn't work with [information assets], and the accountants haven't come up with a good general valuation procedure."

Thus, in many companies the sole measure for securing data consists of restricting physical access to the mainframe computers. Users still scribble their passwords on slips of paper and tape them to their terminals, and anybody from the president to the night cleaning crew can see them and access any data they want.

Inside threat

Despite the occasional spectacular story and the recent movies about hackers breaking into large corporate or government computers, Grindler says the main security danger is not outsiders breaking in but rather employees possessing legitimate access to data. Furthermore, theft of sensitive information is not the main concern. What gives corporate security officers nightmares is the possibility that valuable data will be corrupted.

"Computer security protects against the majority of exposure — human error," Grindler explains. "Humans are human, and a layer of computer security that defines who can get to what data when — and how they can get to that data — sometimes prevents accidents."

"The No. 1 security problem is people making mistakes," says Robert Courtney, an independent consultant. "Right behind this is dishonest employees. The only way to control authorized users is to provide the assurance that they will be caught if they cheat."

Naturally, security officials are also concerned about direct theft either by outsiders or by employees working as spies for competitors. These officials are concerned about deliberate alteration or deletion of data intended either to benefit the perpetrator or some outside organization or simply to express spite or revenge.

Thus, the current emphasis in computer security is on access control. By limiting the number of people who can see or change data, a company minimizes the risk of either a careless error or a dishonest act. And by providing a complete audit trail that shows who has made each change, such systems ensure that employees know they will be caught if they do something wrong.

"We look at computer security as a layered approach," Grindler says. "One layer is a logon identification that identifies the user to the computer. A second layer is a password associated with that ID to prevent unauthorized users from using the ID. A third layer is a data access control package that determines who can get to what data and what they can do with it.

"Generally, you will find that those three layers are — as Donn Parker would call it — a standard of good care. You've taken reasonable business steps to protect the data," he says.

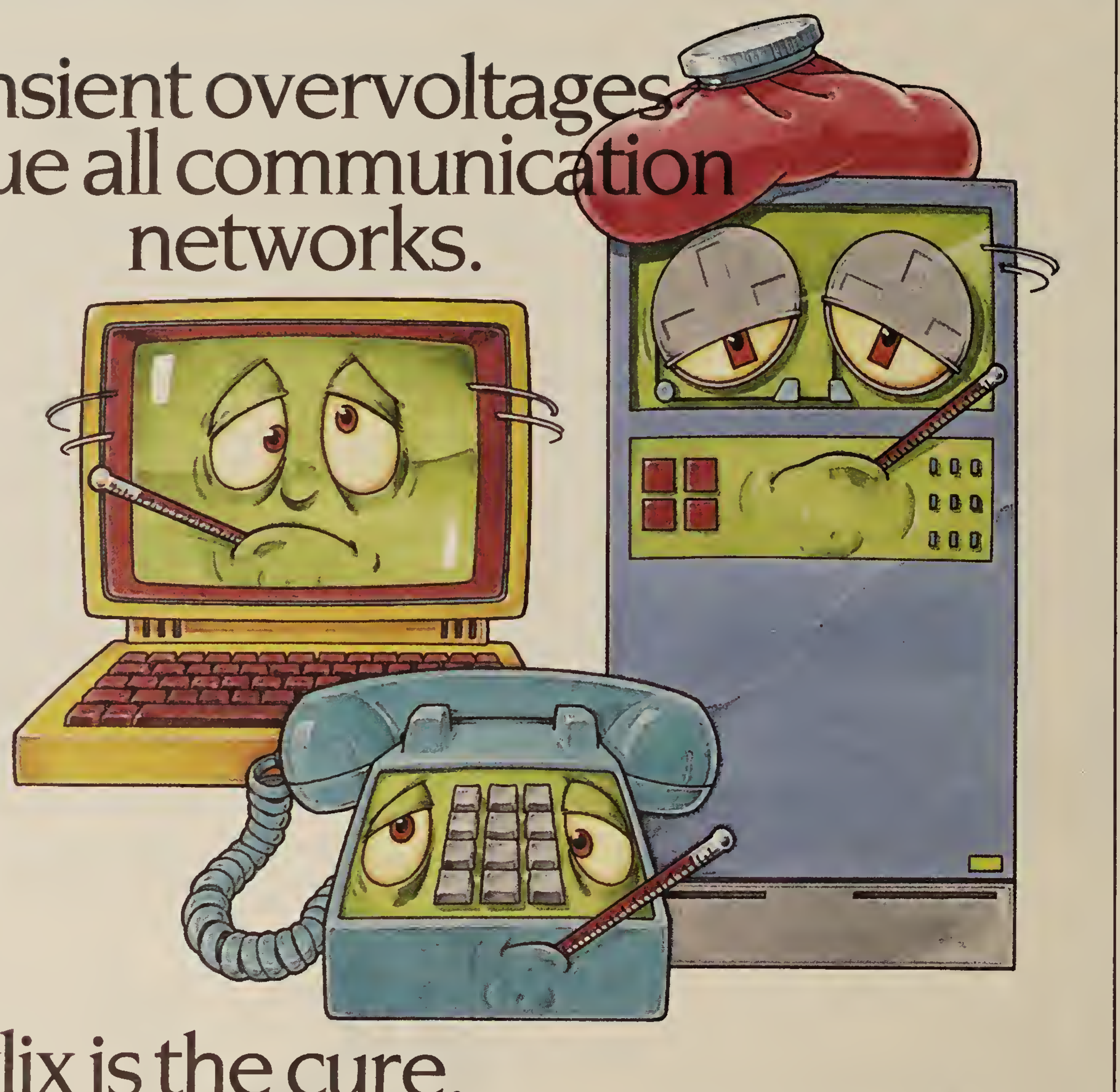
A fourth level of security

Encryption, Grindler says, is a fourth level of security that can be useful in certain circumstances. "You might want to use data encryption where the data will reside outside your normal control environment," he says, "for instance, when data is transmitted between sites, processed on-line or shared."

As with everything else in business, cost justification is an issue in data encryption. Encryption has a price, which is the total of the cost of the initial software investment, the extra time that encryption and decryption require and the training and management distribution of decryption keys. The tradeoff is in losing efficiency for protection. Management must ask itself what this protection is worth and how much is actually needed.

Many companies start by going for everything, only to cut back when they find out the price. Sanford Sherizen, a Natick,

Transient overvoltages plague all communication networks.



Cylix is the cure.

It can happen to any of the links in your communication network, anywhere, at any time.

It can be caused by lightning, electrostatic discharge, or even just ionized air.

In fact, the only certain thing about transient overvoltages is their high cost — which, including downtime, servicing and employee salaries, can run as much as $10,000 an hour for a medium-sized company with a modern data communication network. Not to mention the damage to company equipment and reputation.

But have no fear. The Cylix Corporation provides an extremely effective remedy for the overvoltage ills. The Cylix line of Transient Surge Protectors.

Combining avalanche diodes for speed and gas tubes for sheer power, Cylix protectors provide maximum security in nanosecond response time. And, unlike similar products on the market, our components are modular and easily replaceable. Which means that, whether you're an OEM or an end user, you get convenient, custom-tailored protection. For anything from single sites to entire networks.

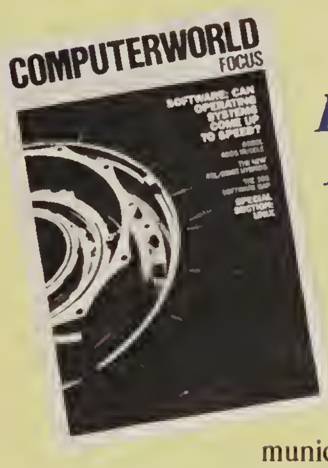
Available in a variety of models to fit every need, Cylix protectors are just what it takes to keep your equipment — and your business — in good health. For more information, contact us at (516) 361-7340, or write: The Cylix Corporation, 550 Smithtown Bypass, Smithtown, NY 11787.

THE CYLIX CORPORATION

Start your subscription now, and save $9!

JUST 69¢ AN ISSUE

For over 20 years, COMPUTERWORLD has covered the ever-changing field of information systems like no one else. And we're moving into the next generation of technological advances with an expanded staff, more features, and the same determination to keep you on top—and slightly ahead—of new developments. Join the celebration! One full year (51 issues) costs just $35, a savings of $9 off the basic rate, and only 69¢ an issue!



PLUS 12 BONUS ISSUES

When you subscribe to COMPUTERWORLD, you also get 12 monthly issues of Computerworld Focus, FREE. Each issue covers one particular topic—in depth. Topics include microcomputing, communications, software, connectivity, and much, much more. Leading edge information —for subscribers only!

PLUS A FREE MAGIC MUG

What's a 20th Anniversary Celebration without something to remember it by? This unique COMPUTERWORLD coffee mug features a special "magic message" when it's filled with a hot liquid. And it's *yours free* with your paid subscription to COMPUTERWORLD.

Subscribe today by returning the order form in this postage-paid envelope now!

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST CLASS MAIL PERMIT NO. 55 SOUTHEASTERN, PA 19398

POSTAGE WILL BE PAID BY

CIRCULATION DEPARTMENT
COMPUTERWORLD
P.O. BOX 1016
SOUTHEASTERN, PA 19398-9984

COMPUTERWORLD

Now in our 20th year!

Reporting the future since 1967...

Join the celebration and save!

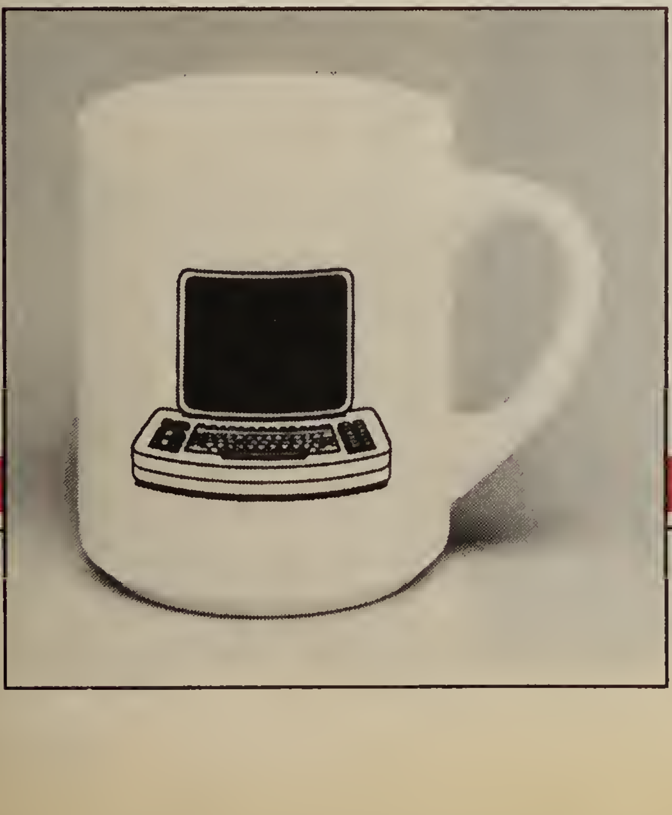
For twenty years, COMPUTERWORLD has kept the Information Systems Professional right on top of the latest developments — and even slightly ahead. Because we don't just tell you what's happening now. We tell you what's about to happen, too. What to watch out for. What you can prepare for. What implications there are for you and your company's future. Get in on the future — now! With COMPUTERWORLD. During our 20th Anniversary Savings celebration.

New or Current Subscribers

If you're not a COMPUTERWORLD subscriber now, sign up today! If you're already a subscriber, take advantage of this special opportunity to extend your current subscription at low Anniversary Savings. Use the self-mailing order form attached. Or call toll free **1-800-544-3712.** (In PA call collect 212-768-0388.) Don't miss out on this great celebration offer. Order now!

JUST 69¢ AN ISSUE One full year of COMPUTERWORLD (51 issues) costs just $35, a big savings of $9 off the basic rate, and only 69¢ an issue! What better way to move into the next generation of technological advances than with COMPUTERWORLD — all for just 69¢ a week. You can't beat it. So join us — now!

PLUS 12 BONUS ISSUES When you subscribe to COMPUTERWORLD, you also get 12 monthly issues of COMPUTERWORLD FOCUS at no additional charge. Each issue covers one particular topic. So you get in-depth analysis and comprehensive reporting of such timely subjects as microcomputing, communications, connectivity, software, and much, much more. Leading edge information — for subscribers only!



PLUS A FREE MAGIC MUG What's a 20th Anniversary celebration without something to remember it by? This unique COMPUTERWORLD coffee mug features a special "magic message" when it's filled with a hot liquid. It's a great way to begin every day — and it's yours free with your paid subscription to COMPUTERWORLD. Subscribe today by returning the self-sealing, pre-addressed, postage-paid envelope attached. Or use the card you'll find inside this issue. For even faster service, use the toll-free number! Hurry, offer ends July 10. Act now!

COMPUTERWORLD

Mass.-based security consultant, says, "Senior management wants everybody to be involved in security and at the same time wants everybody highly productive. And what somebody has to say is, 'You can't have both; you have to make some trade-offs.' "

The petroleum industry was the first private industry to adopt encryption as a standard practice. Its main use is to protect seismic data sent from field sites to corporate central offices. For these companies, illicit interception and reading of highly valuable data is just as great a risk as alteration or forgery of messages.

International corporations offer another reason to encrypt. "There's a recognized need for data encryption in trans-Atlantic business communications, not because of private people intercepting radio communications but because some foreign governments read all business communications going over their government-owned telephone systems as a matter of course," Courtney says.

Large corporations are often just as upset about government officials knowing the details of their business plans as they are about the competition reading them, especially since governments often want to control everything corporations do.

Encryption is also becoming popular for protecting sensitive data stored on office personal computers. "The PC has some of the characteristics of a communications line, in that it is basically unprotected," says Dennis Steinauer, a manager in the Computer Security Management Group at the NBS. "We know anybody can get to it, so let's make sure that no one can read it when they do."

Electronic bank guards

One area in which the use of encryption is growing rapidly is banking. Both wholesale and retail banking use it heavily in virtually every application involving the electronic transmission of sensitive data. Wholesale banking involves the daily transfer of millions of dollars between major banks. These transfers are undertaken mainly to balance the bank's own books, as customers receive and make payments that involve accounts in other banks.

The banking industry is using encryption not to prevent unauthorized people from reading the messages — the historic use of encryption in the military and espionage environment — but rather to prevent electronic theft.

Last fall, the Federal Reserve System announced that by 1988 it would require all fund transfers to and from its regional branches to be encrypted. As banks switch to encryption for transfers going through the Federal Reserve, they are starting to use it for all their transfers.

The emphasis in fund-transfer encryption is message authentication: If a message arrives properly encrypted, a bank is assured of its authenticity. "Encryption makes it very hard for someone to intelligently change the data," says Eddie Zeitler, vice-president and manager of the Information Systems Security Division of Security Pacific National Bank in Glendale, Calif. "Also, when I use encryption, I am confident that the data is coming from the location that I think it is."

Similar concerns are behind the inclusion of encryption in the Electronic Business Data Interchange. This is a new standard for electronic invoicing being developed by a group of large corporations. "Electronic invoicing is how large corporations will do business in the future," explains Miles Smid, manager with the NBS Security Technology Group. He says NBS is using encryption when it wants extra security for transfers.

DES is the only standard for data encryption intended for commercial use, which is responsible for much of its popularity.

Encryption is already used almost universally in automated teller machine (ATM) networks for the same reason. Because ATMs are scattered among many locations and are used 24 hours a day, they could be vulnerable to line tapping — much more so than wholesale electronic fund transfers. The latter are conducted among a limited number of locations on hard-to-tap trunk lines and are handled by a few highly trained people.

The major danger in ATM systems is that a criminal will get someone's personal identification number (PIN) and write an electronic check. ATM networks commonly encode parts of transactions at the source. What is encoded is not the amount being transferred but the user's PIN. And because the code key is changed constantly — often daily — a customer's account is protected from illegal access.

Outside of the petroleum industry, the most popular algorithm in private use is DES. Developed by IBM in the late 1970s, DES was formally adopted by the NBS and the NSA in 1983 as a joint standard for nonclassified data encryption. It is the only standard for data encryption intended for commercial use, which is responsible for much of its popularity.

Official government endorsement is very important for private encryption users. "If you buy some other algorithm that hasn't been suitably tested, how do you know it's all right?" consultant Courtney asks. "That was the reason the NBS first advertised for algorithms to be jointly reviewed by them and the NSA. They saw a number of crypto boxes coming into the market whose algorithms were quite

Continued on page 80

With Jnet software you can merge the power of your IBM mainframe and the Digital VAX simply and inexpensively. And here's why:

- The Jnet investment typically costs $8,000–$25,000. Others often cost $150,000 or more.
- When on the VAX, Jnet installs, works and acts like VMS software.
- We accept IBM protocols so the IBM network can be extended with no new language to learn.
- All you need is Jnet software. No additional software, no hardware, no training and no extra people.
- Put Jnet up and forget it. 700 installations world-wide are using Jnet daily without interruption.

For electronic mail, file transfer, or real-time messaging between VAX and IBM, look to Jnet. Call or write us soon.

IBM is a registered trademark of International Business Machines Corporation.
Digital is a registered trademark of Digital Equipment Corporation.

Joiner Associates, Inc., 3800 Regent St., P.O. Box 5445, Madison, WI 53705-0445, Phone (608) 238-8637, Telex 650 110-6813

Seeking the ultimate in security

Data encryption attained new standing in the minds of corporate DP managers last fall when the Federal Reserve Bank announced that, starting in 1988, all electronic funds transfers between private banks and the Reserve's branches must be encrypted using the Data Encryption Standard (DES). Thus, a month later, when the National Security Agency (NSA) announced that it would not recertify DES in 1988 when its present five-year certification ran out, the Federal Reserve was embarrassed, and the banking industry disturbed.

However, resistance to the NSA proposals, spearheaded by the American Banking Association, expressed concern that member banks had already invested heavily in DES devices. This resulted in negotiations that led to a compromise, in which the NSA would certify DES for financial institutions for another five years.

In the meantime, however, the NSA announcement shook up the banking industry. Data security officers trying to sell encryption to non-technology-minded upper level management had argued that government certification guaranteed DES to be an adequate algorithm; the announcement pulled the rug out from under them.

Many organizations retreated from starting their own implementations of DES and adopted a wait-and-see attitude. SRI International senior management consultant Donn Parker estimates that the NSA announcement "probably set cryptographic use in the private sector back about a year."

No one is willing to put a figure on how much it would cost the banking industry to replace its existing DES hardware — which includes virtually every automated teller machine in operation in the U.S. — but everyone agrees the cost would be large. Of course, the banks could continue to use DES regardless of NSA recertification. However, the end of certification would mean the termination of the NSA's program of testing DES hardware.

Replacement no good

Many companies found the NSA's proposal for a replacement impractical. The agency proposes replacing DES with a set of six algorithms it is developing under the Commercial Computer Security Encryption Program (CCEP). While the DES algorithm is published and available to anyone who wishes to purchase it, these new schemes would be kept secret. Companies wishing to use one would have to buy a sealed device from the NSA.

Furthermore, the NSA would also supply each user with an initial password. It was not entirely clear whether it would supply all passwords or would allow users to change passwords themselves once they had their devices. If the NSA supplied all passwords, it would be able to read everything transmitted in CCEP codes.

While this would help the NSA, it is totally unacceptable to private corporations, which value their privacy highly. Not only would it make the government privy to all sorts of private corporate information, it could raise legal questions as to whether information could continue to be considered proprietary once it was broadcast in a code the federal government was known to be able to read.

Furthermore, the new regulations would severely restrict who could own one of these devices. No foreign company would be allowed to own one — nor would U.S. branches of large foreign banks. The devices would also not be exportable beyond U.S. borders. By some interpretations of that rule, foreign branches of U.S.-based international companies would not be able to use them.

These regulations would leave U.S. banks and corporations that do business daily with U.S. branches of foreign banks in the awkward position of not being able to protect their transactions with those banks, thus severely limiting the CCEP encryption's usefulness.

Breaking the code

The reason for the changes, the NSA says, is that it fears future compromise of the DES standard. One thing that triggered the NSA announcement was that the International Standards Organization recently adopted DES as an international standard, which will encourage its use by foreign corporations, making cracking it more rewarding to criminals.

As it becomes more more and profitable to break the DES code, the standard is likely to attract better-trained people with access to larger computers. At the same time, the constant drop in the cost of computer power makes those same resources available to more people. At some point, DES will cross a threshold at which devoting the effort and resources to crack it becomes profitable. The NSA fears that threshold is approaching.

In fact, some people believe DES is already compromised — by the NSA itself. "There are probably an equal number of people at each end of the spectrum," says San Franciso-based consultant Cheryl Helsing, a former vice-president of security at Bank of America National Trust & Savings Association. "One group believes that the government either cracked the DES or allowed it to become a standard, knowing they could crack it. The other group believes DES is too secure, and the NSA wants to replace it because they can't crack it."

The negotiations were not without value for both sides of the security issue, however. The NSA learned something about the security needs of private organizations as opposed to those of government agencies, and several DP managers who were involved in the negotiations agree that the NSA staff genuinely wishes to be cooperative.

Helsing, head of the American Banking Association's Data Security Commission, which negotiated with the NSA about the future of DES, says after the hearings on the new NSA proposals, Patrick Gallagher, head of the National Security Center, a branch of the NSA, came to San Francisco to learn more about the real security needs of the banking industry. As a result, most DP managers and consultants involved in data encryption expect the NSA to eventually develop a program that better suits their needs.

Not the final solution

On the other side, the controversy made corporate officials realize that DES is not an ultimate security answer. One result is that vendors are beginning to develop DES devices with replaceable chips. Theoretically, when DES is replaced, device owners will buy new chips and plug them into their existing devices rather than buy and install new hardware. The problem, of course, is that since the vendors do not know exactly what they are designing, they cannot be sure that their designs will work with any of the encryption algorithms that eventually replace DES.

In the meantime, says Joan Reynolds, corporate data security officer at Chemical Bank in New York, "I don't think anyone is saying DES is not good enough for unclassified data. On the other hand, no one is saying the government should stop the CCEP effort, which involves looking for other algorithms. We want both."

G. BERTON LATAMORE

HYDRA®
Direct Channel Attached Protocol Converter Controller

•Terminal Emulation • Printer Emulation • Communications •
Our Customers Agree that HYDRA is *the* Solution.

Ease of Use
"Every application we looked to use HYDRA for has been accomplished. We are amazed with the simplicity and flexibility that HYDRA offers. We use HYDRA to drive laser printers as 3211 printers, support several types of ASCII terminals, and for PC to Host file transfer. For both local and remote applications HYDRA has been a tremendous help. We didn't even need a system programmer to set everything up."
Buddy Allee
Data Processing Manager
Tower Life Insurance, Co.

Communications
"As Hawaii's premier inter-Island carrier it is vital for the information we transmit to reach its destination. This is why we chose the HYDRA. It enables us to use local and remote (including mainland) PC's to communicate data to/from our mainframe. We also download files containing member lists into PC's for preparation of personalized letters, for example, to our frequent fliers. We have been very impressed with HYDRA's performance!"
Natalie N. Playdon
Director-Computer Services
Aloha Airlines

Terminal Emulation
"HYDRA has been extremely effective in PC and switched access to the Host. Our students can use their PCs as a work station or a 3270-type terminal connected to the HYDRA. We have over 250 devices supported on 3 systems by HYDRAs which eliminated the need for additional dedicated controllers. We found HYDRA costs less than we were spending on our previous protocol converter each year in maintenance alone."
Kelly McDonald
Technical Support Manager
Brigham Young University

Dial-In Support
"HYDRA allows students and programmers off campus to dial-in and work on projects. With support for such a wide variety of devices HYDRA enables virtually any ASCII terminal or PC to talk to our system. This is ideal for us as we can cater for students no matter what terminal or PC they may be using. We are thrilled with the performance of the HYDRA and would definitely recommend it as a strong asset for any data processing center."
Dwight Ayle, Sr. Instruction
Programmer Analyst
Mt. San Antonio College

1403 Printer Emulation
"HYDRA's 1403 printer emulation has been a real money saver for us. We use Printronix 600 LPM printers defined as 1403's for jobs that would normally require expensive laser printers. HYDRA's versatility made it possible for us to generate our bar coded inventory tags. Our customers and programmers also appreciate HYDRA's dial-in capabilities."
Steve Brown
Data Processing Director
R.M.S.A.

3211 Printer Emulation
"With HYDRA's 3211 printer emulation support, our customer reps can print sample documents on their matrix printers and review them before we begin a major production run. We had a definite need, and HYDRA was the solution to our problem. What really helped was not needing to go through a front-end processor or additional controllers. HYDRA channel attaches, which made things very simple for us."
Jim Mountain
System Consultant
Mailing Services of Pittsburgh

Their Solution Can be Your Solution!
Call Today! **800-55-HYDRA** In California (714) 770-2263
For full details and your closest HYDRA dealer

JDS MICROPROCESSING
22661 Lambert Street, Suite 206, El Toro, CA 92630

Security

CONTINUED FROM PAGE 78

weak. Not only would people have had trouble talking to each other — because they would have to encrypt and decrypt everything — but they would be using weak algorithms that didn't provide the protection they thought they were getting."

Despite some criticism that the DES key, with its 56 active bits, is not long enough, which makes it easier to crack, nobody has yet proven publicly that DES can be broken. Trying to break DES has become a favorite puzzle among mathematicians, though, and the prestige involved makes it likely that if mathematical researchers did crack the code, they would announce their success immediately. This makes DES the most heavily tested encryption algorithm now available, a fact that pleases users who lack the capability to administer private tests of data encryption schemes.

Another advantage of using DES is that the NSA tests and certifies all DES hardware and software. This is important to corporations that lack the capability to run their own tests (see story page 79).

Harold Highland, retired professor of mathematics and editor-in-chief of "Computers and Security," the official journal of the International Federation of Information Processing Technical Committee 11, tests PC-based DES products. "There are people out there selling DES products that are not true DES," he says. "An NSA certification is a guarantee that a product implements the full DES, not just a subset."

DES's status as the standard for commercial encryption also has legal repercussions. If a bank customer is robbed electronically because the bank's code had been cracked, he might sue the bank. The firm would find it easier to prove it had acted prudently if it was using DES rather than a nonstandard algorithm.

The DES offers a purely practical advantage as well. There is another tradeoff in encryption: The more secure the code, the longer the key and therefore the more time it takes to encrypt and decrypt. Because it has not been cracked — at least not publicly — and because encrypting and decrypting with DES works faster than it does with other available secure encryption schemes, DES strikes a good balance between cost and benefits.

Finally, because DES is the only encryption algorithm officially supported by the federal government for public use, it receives backing from other government agencies as well. For instance, when the Federal Reserve Bank announced its plans to require encryption of electronic fund transfers, it specified DES. If the government passes laws requiring encryption in other areas, or if insurance companies start encouraging encryption to minimize certain kinds of risks, they will also probably specify DES.

Others in the game

DES, however, is not the only highly secure code available for private use. The petroleum industry, which was involved in encryption before DES was established, uses private encryption algorithms supplied by several specialized companies, such as Datotec in the U.S. and Redtag, Greytag and Crypto AG in Europe. These private schemes offer the advantage of being unpublished; thus, a would-be wiretapper has to figure out both the algorithm being used as well as the key before decoding the message.

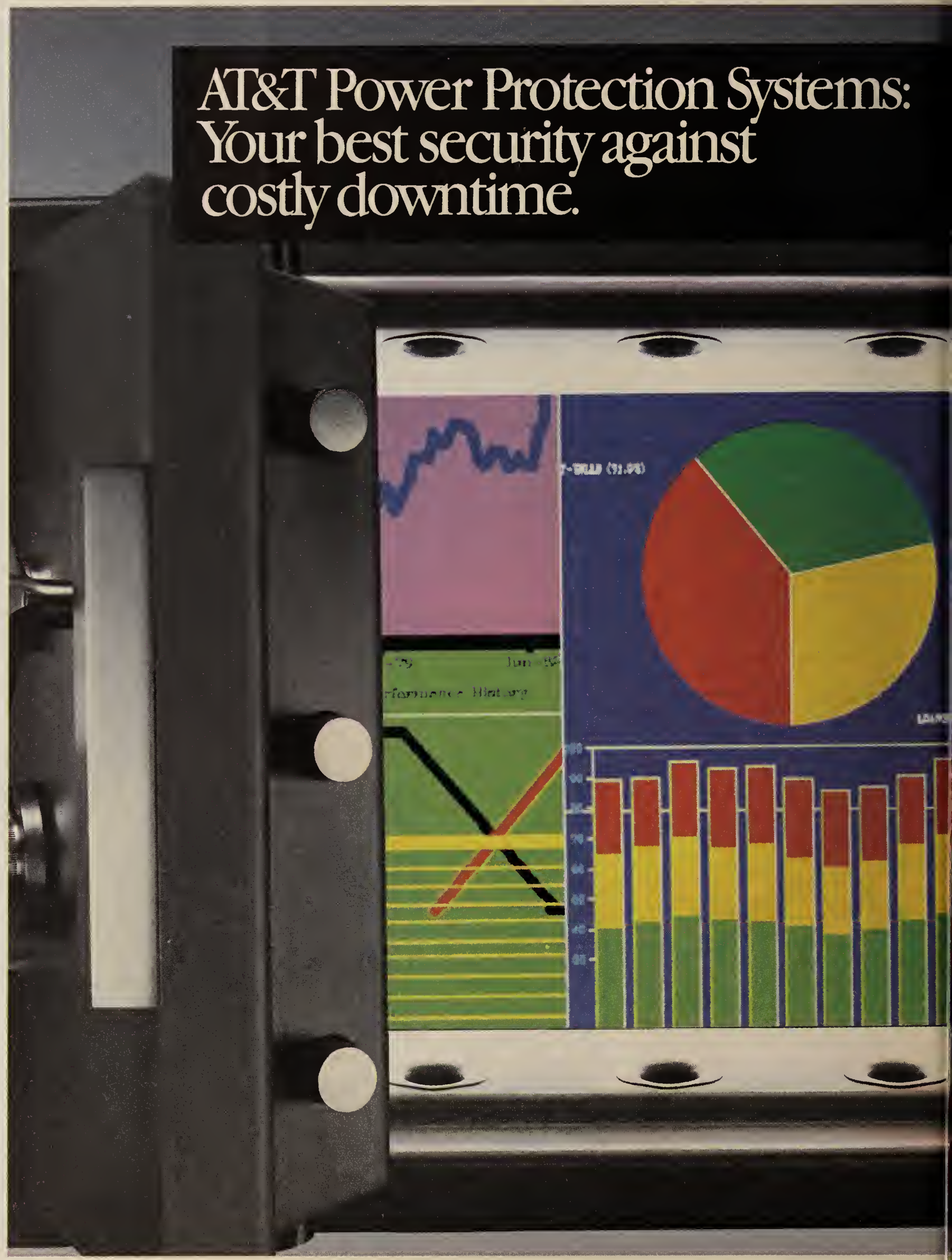
A public key cryptology developed by RSA Data Security, Inc. in Redwood City, Calif., is also becoming popular for public applications. Public key algorithms are based on one-way mathematical functions — functions that are easy to do one way but next to impossible to do the other. For example, squaring a number is easy, but finding its square root is difficult.

Therefore, one uses one key to encrypt and another to decrypt, and it is nearly impossible to predict the decryption key from the encryption key. If users wish to have messages sent to them in code, they can post the encryption key. It does not matter who has it because the encrypted messages cannot be read without the decryption key, which only the message receiver has. Message senders cannot even decrypt their own messages without the second key.

"Public key cryptography is particularly good at supplying authenticity," says Ronald Rivest, a MIT professor of mathematics and a founder of RSA. "It lets you create digital signatures that are good only for the person sending the document and only for that document. Because the encryption and decryption keys are different, just because I can read your signature doesn't mean I can duplicate it."

Several public key schemes have been marketed, but so far only the RSA code has stood up to repeated independent tests. It is based on the classic mathematical puzzle of factoring primes. This is based on the truth that it is easy to prove that a very large number is not a prime simply by finding a small prime number that will divide evenly into it. However, proving that a very large number is a prime — one with 100 or more places for instance — is a lengthy task.

"The RSA algorithm is exciting mathematically, but it's predicated on our inability to factor the product of large primes," Courtney says. "This is a well-defined problem without a well-defined solution. Yet, mathematical problems have been yielding rapidly with the advent of larger, faster machines. The day [the RSA algorithm] yields, if we are dependent on public key, all that crypto becomes worthless. And that's providing


AT&T Power Protection Systems:
Your best security against costly downtime.

that we know when the problem is solved. If someone solves it secretly, everything encrypted in public key becomes vulnerable to that person."

While the RSA algorithm is very secure, its long 100- to 200-integer keys (and more) make it slow. Instead of replacing DES, therefore, the RSA algorithm is often used with it. Public key cryptology is particularly useful for distributing DES keys. Because only the key sender has the encryption key, and only the receivers have the decryption key, RSA provides these vital messages with a high level of security.

> "MOST COMPANIES that do go for encryption overencrypt. The more data that is encrypted, the easier it is to figure out the key."
>
> HAROLD HIGHLAND
> EDITOR-IN-CHIEF, "COMPUTERS AND SECURITY"

Encryption demands managing keys. Usually when an encryption code is broken, the weak link is the key — either it is too simple, or it is being handled carelessly. A large organization, such as a major bank with a multitude of branches, must manage its keys, changing them regularly, keeping them secure and making sure legitimate users do not lose them and lock themselves out. These organizations must establish policies for access control and management tactics to govern these policies. Doing this can be a complex, expensive process.

Provided that the encryption algorithm is robust enough to stand up to any likely attempts at cracking it, the main danger of encrypted messages being read by unauthorized parties is that the key being used will be compromised. Keys are sometimes exchanged using secure telephone calls or private couriers. Once the key is distributed, stringent security methods must be enforced to preserve it. For instance, it is important that only those who really need to know the key have it. And it does little good to encrypt messages if those involved jot down the latest key on a memo sheet and tape it to the corner of their terminal screens.

Key management poses other complications as well. Whenever users encrypt, they run the risk of losing the key. If this occurs, the data becomes just as inaccessible to them as to anyone else. This is dangerous when encryption is used on a PC, when only one person possesses the key. Managing keys is also involved heavily with the issue of what and what not to encrypt. "Most companies that do go for encryption overencrypt," Highland warns. "They take too many documents that are not sensitive and encrypt them. The more data that is encrypted, the easier it is to figure out the key."

For instance, he says, several years ago he was an expert witness in a lawsuit against a New York school district accused of bias against awarding tenure to older teachers. To help defend the school district, Highland asked the state school department in Albany for information on teacher hiring practices statewide. He received a tape containing a large amount of data, including an encrypted list of the names and addresses of all teachers working for public schools in New York. He brought this list to one of his classes as a problem, and in a single-class period the students were able to break the code simply by attacking the zip codes.

Another reason to encrypt as little as possible is that the more encrypted data crackers can work with, the easier it is to confirm the solution. "One of the most commonly misunderstood issues in breaking a code is recognizing success," Courtney says. "Particularly with a short message, any number of thousands of messages will seem reasonable. How many extra cycles of the code cracker's computer will it take before the cracker knows that the latest reasonable answer is the correct one? The only way to be sure is to have the clear text and the encrypted text — otherwise you will go right by the right answer."

Encryption: changing, growing

Data encryption is here to stay. Furthermore, it is likely to spread from banking to other industries, as telecommunications replace paper communications and financial transactions go electronic. With the trend toward decentralization, distributed processing among several remote sites is becoming a common business practice, and encryption will become standard with software used by corporations.

For the present, the DES will remain the dominant form of encryption for private corporations — despite the NSA's attempts to move away from it — simply because it currently is the only adequate choice. However, the DES is an aging standard; a replacement should appear by the end of the decade, and by 1995 at the latest, the DES will appear.

"Every encryption algorithm's days are numbered," explains San Francisco-based consultant Cheryl Helsing. "Everyone knew that DES would have a useful life. The only question is how long. There is no evidence today that it has reached the end of that useful life. We hope the federal government will develop a replacement and continue constantly developing new algorithms." •

Eliminate the cause of up to 50% of your computer downtime: power disturbances.

Power disturbances, brief and imperceptible, cause very visible data loss, data errors, and equipment damage, all resulting in costly downtime.

According to AT&T Bell Laboratories and IBM research, a typical computer site experiences as many as 135 commercial power disturbances a year, accounting for up to 50% of all computer downtime.

The protection solution.
AT&T offers two product lines to combat these disturbances: the Uninterruptible Power System (UPS) and the Power Line Conditioner (PLC). Each effectively eliminates power fluctuations, including noise, transients, peaks, brownouts, and distortions. The difference being that the UPS includes a built-in battery reserve for protection against blackouts. The UPS is available in 1, 3, 5 and 10 KVA power ranges. The PLC is available in 3, 5 and 10 KVA models.

A 50-year advantage.
Why specify AT&T's power protection equipment over that of other manufacturers? Because AT&T has an unmatched 50 years of experience in manufacturing power equipment. And, because AT&T also designs and manufactures computers, we have a unique understanding of what should go into a superior power protection product.

For instance, our parallel processing architecture offers reliability few others can provide. It also maximizes cost-efficiency: less power is needed to run our systems, and heat loss is substantially reduced.

Easy does it.
AT&T UPS and PLC power protection systems are easy to install, need no operator, and require no scheduled maintenance.

Furthermore, AT&T backs you with an unequalled nationwide service network and a 24-hour toll-free number for technical service support.

Fast delivery.
AT&T is ready to ship from stock. Once our Dallas facility has your order in-hand, we'll have your system speeding on its way to your site.

So for maximum security against power disturbances, along with low-cost, trouble-free performance, call AT&T at 1 800 372-2447 or mail the coupon below. Let us show you how to turn expensive downtime into productive uptime.

© 1987 AT&T

AT&T Power Protection Systems CW 6/1/87
Dept. 203130-LEADS, 555 Union Blvd., Allentown, PA 18103
Please send me more information on UPS and PLC.
Name ____
Title ____
Company ____
Address ____
City ____ State ____ Zip ____
Phone ( ) ____

AT&T's UPS is available in 1, 3, 5 and 10 KVA models.

AT&T
The right choice.

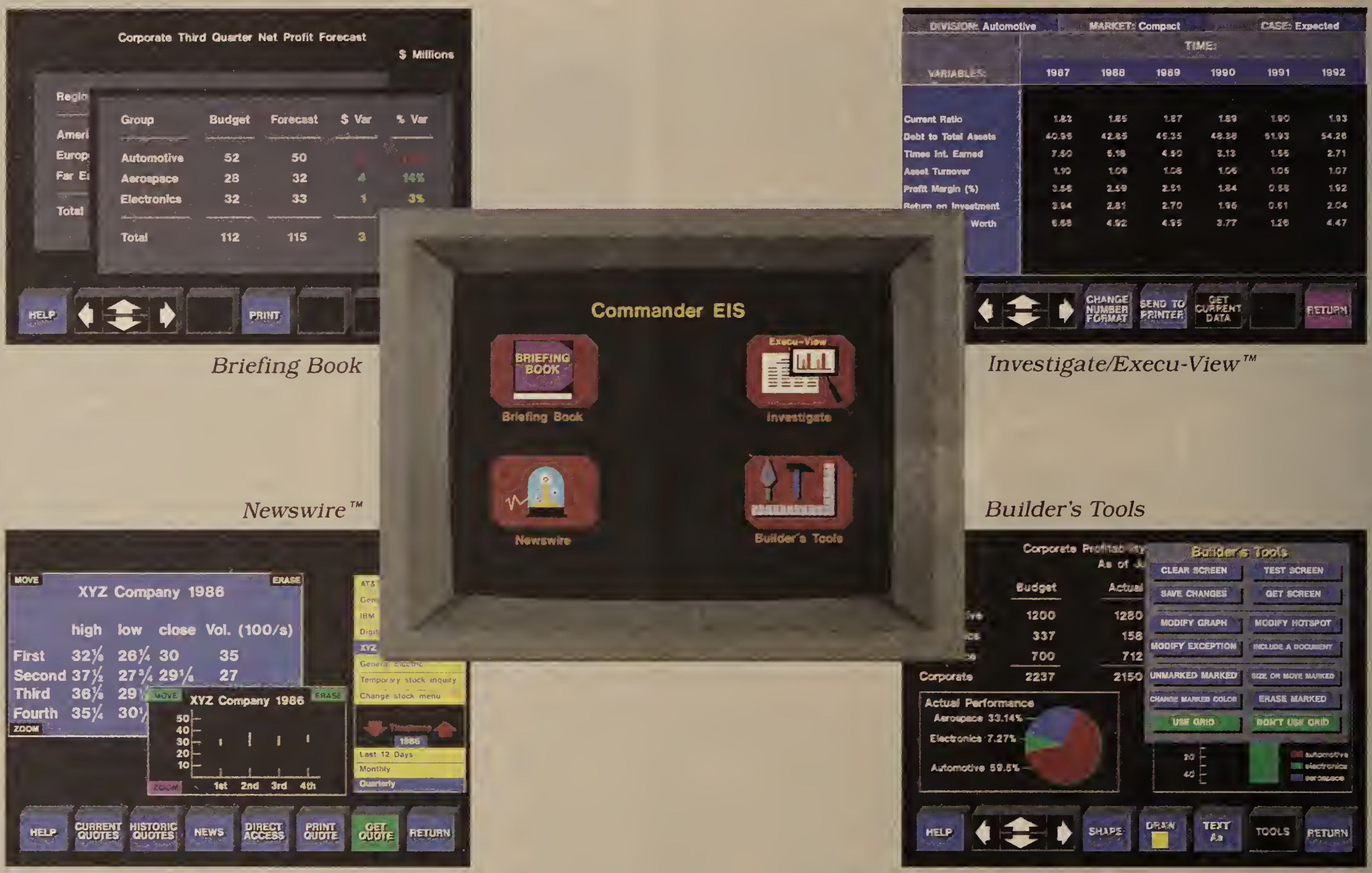
COMMANDER™

Executive Information System

SEMINAR

Why are executives using EIS?

How much support does EIS require?



Briefing Book

Corporate Third Quarter Net Profit Forecast

$ Millions

Group	Budget	Forecast	$ Var	% Var
Automotive	52	50	[illegible]	[illegible]
Aerospace	28	32	4	14%
Electronics	32	33	1	3%
Total	112	115	3	

Investigate/Execu-View™

DIVISION: Automotive MARKET: Compact CASE: Expected

VARIABLES:	1987	1988	1989	1990	1991	1992
Current Ratio	1.83	1.85	1.87	1.89	1.90	1.93
Debt to Total Assets	40.95	42.85	45.35	48.38	51.93	54.26
Times Int. Earned	7.50	6.18	4.50	3.13	1.55	2.71
Asset Turnover	1.10	1.09	1.08	1.06	1.05	1.07
Profit Margin (%)	3.56	2.59	2.51	1.84	0.58	1.92
Return on Investment	3.94	2.81	2.70	1.96	0.61	2.04
Worth	5.68	4.92	4.95	3.77	1.26	4.47

Newswire™

XYZ Company 1986

	high	low	close	Vol. (100/s)
First	32⅛	26¼	30	35
Second	37½	27¾	29⅛	27
Third	36⅛	29		
Fourth	35¼	30		

Builder's Tools

Corporate Profitability

	Budget	Actual
	1200	1280
	337	158
	700	712
Corporate	2237	2150

Actual Performance
Aerospace 33.14%
Electronics 7.27%
Automotive 59.5%

How does EIS integrate diverse information sources?

How easy is EIS to implement?

Dates and Locations

Atlanta, GA	May 19
Austin, TX	June 10
Birmingham, AL	May 21
Boston, MA	May 27
Charlotte, NC	June 9
Chicago, IL	May 21
Chicago, IL	June 23
Cleveland, OH	June 16
Dallas, TX	May 20
Denver, CO	June 3
Detroit, MI	May 27
Grand Rapids, MI	June 2
Hartford, CT	June 4
Houston, TX	May 27
Indianapolis, IN	May 27
Irvine, CA	June 4
Los Angeles, CA	May 27
Memphis, TN	May 27
Miami, FL	June 2
Minneapolis, MN	May 27
Nashville, TN	May 28
New Orleans, LA	June 17
New York, NY	June 2
Orlando, FL	June 4
Parsippany, NJ	May 27
Philadelphia, PA	June 2
Phoenix, AZ	June 23
Pittsburgh, PA	June 18
Research Triangle Park, NC	June 10
St. Louis, MO	June 10
Salt Lake City, UT	June 24
San Antonio, TX	June 11
San Diego, CA	July 14
San Francisco, CA	May 19
Santa Clara, CA	June 2
Seattle, WA	May 21
Tampa, FL	June 3
Toledo, OH	May 19
Tulsa, OK	June 24
Washington, DC	June 4
White Plains, NY	May 19

Commander EIS runs on IBM mainframes using VM/CMS or MVS/TSO operating systems, and on DEC VAX/VMS. The personal computer component runs on IBM PC/AT, COMPAQ DESKPRO 386 or fully compatible microcomputers with EGA and either a mouse or a touch screen.

Looking for EIS Answers?

Then come to a free Commander Executive Information System Seminar. Not only will you get practical answers, you'll see Commander Executive Information System (EIS) software in action. Demonstrations will include the Briefing Book, Investigate, Newswire, and Builder's Tools applications.

Major corporations have looked to Comshare for flexible, timely information systems for 21 years. And now they look to us for EIS software, too. More than 40 of them have selected the Commander EIS approach. With the experience we've gained from these implementations, Comshare is uniquely qualified to help you make an informed decision about EIS.

Register for the Commander Executive Information System Seminar by calling Chris Kelly at Comshare. 1-800-922-7979. Or in Michigan, 313-994-4800.

COMSHARE®
1-800-922-7979
3001 South State Street
Ann Arbor, Michigan 48108

Copyright © 1987 by COMSHARE, INCORPORATED

Giving end users the MIS seal of good system building

MIS certification of end-user systems offers a win-win solution

BY ROBERT PETERSON

As easy as the problems of end-user involvement in the systems development process are to perceive, it is equally easy to see that the future of corporate computing holds, at its core, the existence and continued proliferation of end-user development. Its benefits are enormous, and, realistically, end-user involvement is the only available mechanism to infuse computing solutions into a corporation at the rate at which they are required.

MIS's task is to solve the problems of end-user development, not to deny the tool, and the first and most pressing issue is the potential for information misrepresentation. One attractive solution to this problem is certification of end-user-developed systems.

Certification is what the end user has been doing with professionally developed systems for years. Its application to end-user systems is simply the reverse of the user acceptance process, in which a system developed by end users is brought to a professional development group, which reviews the system and the process used to construct it. If the product meets the defined criteria, development bestows its imprimatur, indicating that the end-user system carries the same implications of stability and integrity as one built along conventional, professionally developed lines.

Systems development historically has been involved in the process of data-to-information translation, with programmers acting as translators. To ensure that systems were developed efficiently and effectively, four basic characteristics of conventional systems development were established.

Four steps to discipline

The first is that both product and process are of equal importance to professional developers. Concern for how the product is developed as well as for the quality of the product itself generates a professional discipline based on joint control.

The second is that in conventional development, the customer — the user — and the developer maintain an adversarial relationship. Throughout the development process, the user seeks to prove the fallibility of the developer's product, while the developer seeks to avoid any proof of failure. This establishes an effective set of checks and balances.

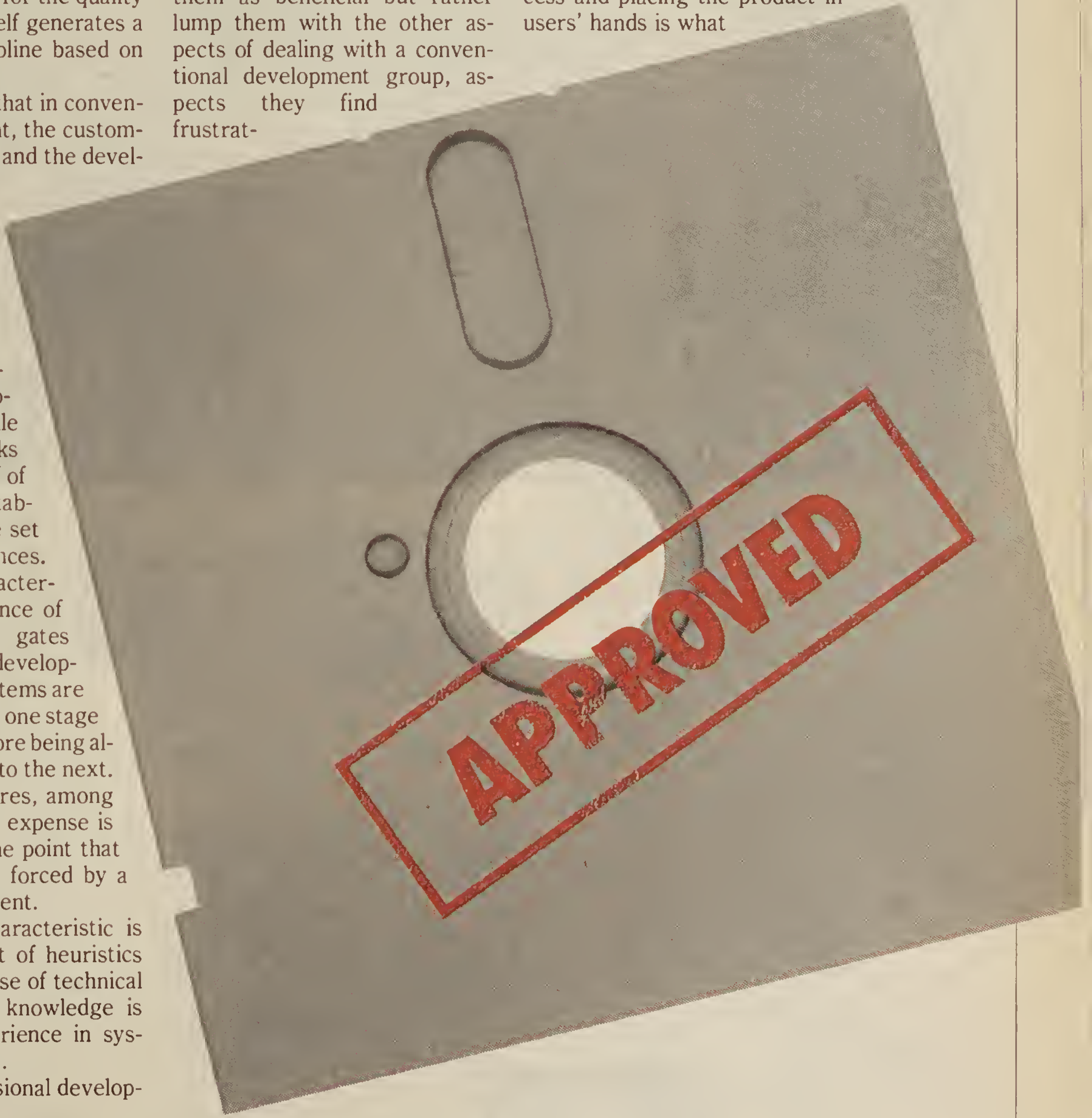
The third characteristic is the existence of formal control gates throughout the development process. Systems are strictly checked in one stage of the process before being allowed to proceed to the next. This control ensures, among other things, that expense is not incurred to the point that implementation is forced by a financial commitment.

The fourth characteristic is an understood set of heuristics evolved from a base of technical knowledge. This knowledge is drawn from experience in systems development.

When a professional development staff constructs a system, the existence of these four characteristics implies product certification. Management assumes the product will do what it is supposed to do.

But end-user development languages allow the end-user developer to bypass these four aspects. Typically, these aspects are so ingrained in the development process that end-user developers do not even recognize them as beneficial but rather lump them with the other aspects of dealing with a conventional development group, aspects they find frustrating. Thus, while some users may match the professional developer's skill and discipline, the development manager must assume that, in end-user development, validity is not the result of discipline but of individual professionalism.

Given that these aspects of conventional development are eliminated in end-user development, one must ask, "So what?" After all, accelerating the process and placing the product in users' hands is what



Peterson, an MIS and management consultant based in Cary, N.C., is author of the book, *Managing the System Development Function* (Van Nostrand Reinhold, 1987).

....

- **Data custodians: MIS's emerging role**
- **Certifying both the product and the process**
- **Policies based on user specifications**

end-user development is all about. Typically, end-user systems are developed quickly, and their support and maintenance are handled by the end user. Also, given the general growth of these products and of end-user computing in recent years, it is easy to see MIS's role evolving into that of a data custodian. So why worry?

For those systems developed purely for a single department's internal use, a problem does not really exist. It is a manager's prerogative to use whatever tools he needs to run his departments. The organization reporting structure ensures that a manager is responsible for the use of those tools. The manager's failure to apply the appropriate level of discipline results in higher costs, lowered efficiency, poor performance — and eventually in the manager's professional demise.

End-user systems represent another tool with which the end-user manager either succeeds or fails. The failure of a department's system is simply a failure on the department manager's part to fulfill his responsibilities. MIS's sole responsibility in that particular mechanism is to ensure the availability of appropriate tools.

Problems with end-user systems generally do not arise until the outputs of such systems move beyond the department itself. At that point, the limitations of end-user systems surface, and the corporate entity is affected.

The principal implications of these limitations lie in the basic difference between data and information. Data, resident in some controlled state (a data base management system, for instance), can be expected to offer a fairly high level of stability and integrity. It is the result of well-grounded processing rules that guarantee 1 + 1 = 2. As the lowest level entity, its very simplicity establishes its immutable definition.

Information is made up of massaged, extracted and combined data. As such, the original integrity of the data is masked. Whatever stability and integrity it bears is the result of the process that created it as much as the integrity of the data that represents its components.

Although one of the principles of data base management is that control of the data's stability and integrity inherently protects the company, it is information on which corporations run, not data.

What follows the lack of discipline in end-user development is the distinct and frighteningly real possibility of corporate failure caused by information misrepresentation. Decisions on corporate strategy may be made based on information presented by someone other than an MIS professional — information that is totally wrong but based on absolutely correct input.

The end-user language does not create the problem, nor is there anything lacking in the data base. The problem is a simple matter of faulty process. Who verified the numbers? Peer user analysts are committed to proving the results right, not wrong. Who verified the process of developing the information? No one. Who verified the viability of the data input? No one.

The right information

Certification is based on two concepts: First, that some systems require certification if the corporation is to make decisions with some degree of safety and accuracy. Second, achieving certification offers some benefit to the developer — in this case, the end user. Both concepts must be satisfied if the program is to be successful.

Systems that require certification are those that affect areas beyond the department that is responsible for the system. One critical reason for this distinction is that when outputs are routed outside a department, the normal organizational responsibilities and measurements are abrogated. The individuals affected by this are not in a position to establish priorities and criticality levels for the product. They are, therefore, vulnerable to interpretations based on the views and priorities of the developing manager.

As a control factor, organizational structures are established to dovetail responsibilities and the ability to control risk. In addition, senior-level decision

ONCE, WE HAD THE SQUINTS...
NOW WE GET THE PICTURE!

Computer projection systems allow you to project data and graphics from your terminal or PC directly onto a large screen. As a result, you can use live, real-time computer information. It's a far cry from yesterday's slide or overhead show.

But computer projection has had its problems too. Until recently, The Squints wreaked havoc in boardrooms, training sessions, and trade shows. Wherever people were forced to view dull and often fuzzy projected color images, The Squints were running rampant.

THE ECP 2000® COLOR PROJECTION SYSTEM IS CHANGING ALL THAT.

Today, many of these people are getting The Picture with the Electrohome ECP 2000. And it's a picture that's brighter and clearer than anything they've seen before.

HOW WE PUT THE SQUINTS ON THE RUN.

The ECP 2000's exclusive single lens system automatically converges colors within the unit to project a crisp, clear, consistently brilliant color image of data/graphics and video. As a result, precise image alignment is virtually effortless - without the need for technical assistance.

Because the ECP 2000 was specifically designed to accept data from computer sources, it offers a higher resolution and frequency range than systems designed for video only.

IT'S EASY TO USE TOO.

The instant the ECP 2000 is turned on, it locks-up to virtually all computer terminals or PCs. It's perfect if you have a variety of computer/video equipment.

Electrohome's exclusive Vari-Focus Control allows you to focus on screens from 5' to 14' diagonal, without the need for complicated adjustments. Three handy knobs on the back of the unit provide all the adjustment necessary. Ease of operation makes the ECP 2000 the perfect system for fixed or portable applications

For more eye-opening information on Electrohome color or monochrome systems, send your business card to: Electrohome Limited, Advertising Department, P.O. Box 628, Buffalo, New York, 14225-0628.

U.S. customers call toll-free

1-800-265-2171

ECP is a registered trademark of Electrohome Limited.

ELECTROHOME

Electrohome Limited, 809 Wellington Street North, Kitchener, Ontario, Canada, N2G 4J6
Telephone (519)744-7111 Telex 069-55449

See us at Comdex Booth #2538

making has a far-reaching and pervasive impact. The effects of such are felt long after the actual information analysis is done.

Equally important is the second concept, that the end-user perceives benefits in seeking certification. Simply defining guidelines for systems that require certification will not be adequate enough. The intelligent user will either seek and find loopholes, or, more typically, a noncertified system will be established for internal applications and slowly take on wider implications.

The benefit that typically spurs users to seek certification is support. Support of a developed system allows users freedom from the burden of interface or feeding-system alterations. It divorces them from the impact of software changes. It allows them to take advantage of MIS's backup, reporting, security and other peripheral administrative activities.

Support can create a significant gain for users — enough, it is hoped, to have them actively seek certification of their developed products.

> TECHNIQUE, style and efficiency are not a component of product certification in any form or fashion, except when standards are involved.

Formality

Certification of a system implies certification of both the product and the process by which it was created. It is a discrete, formal step in the life cycle of a system, just as user acceptance and sign-off is a discrete step in the conventionally developed system's life cycle.

Product certification requires a review of the system to ensure that calculation, translation and data retrieval mechanisms match the intent. The criteria for review is a combination of specifications and data policies that define data and its use. Once these criteria are met, the product can be certified. Technique, style and efficiency are not a component of product certification in any form or fashion, except when standards are involved.

Development process is verified to ensure adequate gating steps were passed and appropriate development procedures were adhered to. This, of course, assumes procedures have been instituted for end-user systems on which the development process can be judged. Examples of gating and verification queries include the following:

- Were data owners informed of data use?
- Did predefined sample-testing take place?
- Was an adequate level of documentation (with distribution) produced?
- Was there some level of review by a third party?

Specific steps will vary widely. The main concern is that an adequate level of comfort can be achieved so that those involved feel the steps are both necessary and meaningful.

Certified systems are stamped as such, and the programs are then cataloged and placed in the systems portfolio. They are effectively protected in libraries so modification cannot take place without formalized change-management procedures being passed.

At this point, the system is effectively no different from any conventional system. Its life cycle is managed as any normal system would be, with the following exceptions:

- The rate of use must be a factor in maintaining support. If the system is seldom used, certification should be dropped, because the business will have evolved around it.
- The responsibility for changes and communicating those changes lies with the owner department, not with MIS.
- The responsible department approves and manages all changes. Essentially, MIS fills a custodial role, not one of responsibility.

How the certification program works, technically, will vary, based on the operating system and the end-user product. Some programming undoubtedly will be needed to accomplish the key elements. The sophistication of this development can be as dramatic as needed for the level of control deemed necessary. There are two basic certification levels: active and passive.

Active certification requires program traps at the execution level between the output and the execution steps. Basically, as an end-user display or report is executed, it is verified against a library to ascertain its current status. If it is pronounced a certified product, its compile data, version level or other status identifier is interrogated to determine its integrity. If it passes verification, the product's certification stamp is displayed on the screen or report.

Depending on the control level desired, one or two additional activities can take place. First, if it is noncertified, that may be displayed instead of the certification stamp. Second, if it is a certified product but verification indicates its integrity may be compromised, an indication is made on the display or report, and an audit record is produced. These audit records are reviewed periodically to find out what happened.

Obviously, active certification represents the zenith of control and the maximum level of development. It also implies expense. Access to the library of certified products should require sophisticated code to minimize its impact. Some space

PC Business World. The definitive source of information on the IBM PC and compatible market in the United Kingdom.

The only U.K. weekly conceived, written and distributed exclusively for the IBM corporate purchaser. With the highest circulation in the U.K. market to key decision makers at IBM PC and compatible user and dealer sites.

But if you prefer to base your ad buying decisions on numbers, not statements, consider this:

- CEOs, Financial Managers, Consultants and DP Managers comprise nearly 20,000 of the over 33,000 controlled circulation of *PC Business World.*
- In 1985, nearly 800,000 IBM compatible PCs, worth $2.7 billion (U.S.), were sold in the U.K.
- During the next 12 months, *PC Business World* subscribers intend to purchase over 744,000 PCs.*

These numbers, along with the following reasons, add up to make *PC Business World* the smartest ad buy for reaching PC users and buyers in the U.K.

PC Business World is a publication of CW Communications/Inc., the world's leading publisher of computer-related newspapers and magazines, with over 55 publications in 28 countries. And over 10 years of experience in the international computer marketplace.

When you advertise in *PC Business World,* you deal *direct* with the publisher through CW International Marketing Services, *not* with a rep firm. Yet, you are still entitled to the full 15% agency commission, with *no* Value Added Tax to offset those commissions.

It also means that you control your ad budget right here in the U.S., are billed in U.S. dollars, and have no time or language barriers to contend with.

PC Business World. Authoritative. Insightful. Focused. Effective. And both first and second-place winner of the 1986 *Hewlett-Packard/Times* Computer Journalist of the Year award. Truly in a league by itself.

For immediate response, call Frank Cutitta, Managing Director, CW International Marketing Services, toll-free at 800-343-6474 (in MA 617-879-0700).

PC BUSINESS WORLD
A CWCI Publication
An International
Data Group Company

*PC Business World Readership Survey, July, 1986.

on screens and reports must be dedicated to the stamping display. Any retrofit on previously developed systems could require some reprogramming. Finally, a reasonably comprehensive library maintenance system must be developed. All these things will cost an organization time and money.

Passive certification represents significantly less cost and, as would be expected, less control. With a passive program, a data base is kept of all systems, inquiries and reports that have achieved certification. This data base should be accessible on an exception basis, when it is necessary to ensure certification was achieved, such as during an executive planning meeting.

> WITH A LITTLE imagination, one can see that end-user systems will gradually take the place of the more traditionally developed MIS systems. The systems development department then becomes a function of certification and data custodianship as well as the development of very complex tools.

In passive certification, the system undergoes the same review of product and process as well as freezing of certified systems. However, few, if any, modifications to operating software need to be made. Naturally, systems will not be verified as often as needed, because that would require taking an extra step beyond review of the actual material.

There are reasons to favor passive certification instead of a more active program. First, from the perspective of the MIS professional, passive certification is certainly better than nothing. Second, it is significantly less costly and therefore will raise few executive eyebrows. Finally, it is a good first step — allowing the front-end verification to be sharply honed before the process creates a high level of visibility.

Basic requirements for success

Whether an active or passive certification program is initiated, certain fundamental elements must be in place. First, there must be well-grounded policies, procedures and standards upon which to judge the systems being certified. The systems cannot be judged according to parameters that users were unaware of when development began.

The procedures, policies and standards are, essentially, the specifications the users set for the system. One cannot change the rules in mid-flight — as MIS developers have been saying about specifications for years.

Second, MIS must publish an intelligently defined portfolio of certified and available products. Without this portfolio, users have no opportunity to choose a previously installed product instead of their proposed one. Without the portfolio, the conflict between the new product and the operational one will not be seen until certification time.

By that time, users have invested enough money and emotion in the product that it will be used whether certification is achieved or not. If MIS wants users to take advantage of previously developed systems, there must be a way to easily review what is available.

Third, users must have a good reason to seek certification. In many cases, the recognition that acceptance provides will be more than enough. Most of the time, however, the reason must be far more quantifiable — such as elimination of maintenance and the gain of support. Whatever incentive is provided, it must be tangible and visible. Otherwise, the program is doomed to fail.

The final requirement is far more abstract and difficult to achieve: Management must actively support the program.

This means, should the output results of a noncertified system be presented at a management meeting, management must refuse to accept it until certification is achieved. Such refusal will unquestionably embarrass someone, and senior management has traditionally been hesitant to do so on issues involving MIS procedures and policies. Without senior management's commitment though, certification becomes a technical exercise, not a strategic program.

Certifying the future

With a little imagination, one can see that end-user systems will gradually take the place of the more traditionally developed MIS systems. The systems development department then becomes a function of certification and data custodianship as well as the development of complex tools.

The MIS organization that looks ahead will begin to take steps now to shape that future in such a way that the organization is protected and well served. Certification represents just one of those steps.

However, MIS executives must recognize that they are taking a major step toward that future. MIS's certification of end-user systems represents the de facto legitimization of those products and that approach to systems development. As with any other issue of strategic impact, certification should be approached intelligently and deliberately, both for the health of the department and the health of the organization. •

INTELLECT.
DP/MIS PRODUCTIVITY
SOFTWARE FOR
DB2 AND SQL/DS

Take another look. Now INTELLECT helps DP/MIS build and maintain DB2 or SQL/DS applications. INTELLECT delivers efficient application building and prototyping, generates expert SQL code, and virtually eliminates user request backlogs.

INTELLECT improves DP productivity for DB2 or SQL/DS with:

1) SQL code generation
2) Production system prototyping
3) Application modification and maintenance
4) SQL training facility
5) DB2 or SQL/DS catalog query and update
6) DB environment monitoring

For management, INTELLECT provides fast English access to complex databases. And INTELLECT's PC Link sends mainframe data directly to workstations in the format users want.

INTELLECT, the first successful AI software tool for IBM mainframes, is used by over 500 organizations worldwide. In addition to DB2 and SQL/DS, INTELLECT interfaces with FOCUS, ADABAS, Teradata's DBC/1012, and our own DFAM design.

Attend a free INTELLECT seminar and demonstration. Take the first step in dramatically improving *your* DB2 or SQL/DS productivity.

INTELLECT SEMINARS

Boston	June 16
Bridgeport	June 3
Chicago	June 18
Dallas	May 28
Detroit	June 11
Los Angeles	June 17
New York City	June 2
Philadelphia	June 9
San Francisco	June 10
Seattle	June 4

CALL (617) 890-8400

☐ I'll attend a free INTELLECT seminar
City______ Date______
I can't attend, but send a brochure______
Name______
Title______
Company______
Street______
City______
State______ Zip______
Telephone ( )______

INTELLECT is a trademark of Artificial Intelligence Corporation. DB2, SQL/DS, and IBM are registered trademarks of International Business Machines Corporation. ADABAS is a registered trademark of Software AG. DBC/1012 is a product of Teradata Corporation. FOCUS is a product of Information Builders, Incorporated.

AICorporation
USING AI TO DELIVER INFORMATION TO MANAGEMENT

Artificial Intelligence Corporation 100 Fifth Avenue, Waltham, MA 02254-9156
(617) 890-8400, Telex 989606

MANAGEMENT

TAKING CHARGE

Gerhard Adler

Europe gains from caution

The following is an excerpt from an address by Adler, managing director of Diebold Deutschland GmbH.

In Europe, unlike the U.S. and Japan, the size of our domestic markets are quite small. We have a language problem and different telecommunications regulations, so it is very difficult to reach a sizable business volume. What is more critical is that we in Europe are slow in applying new technologies. We are always thinking, considering, identifying new problems. All this puts us in a corner, where business is small and difficult.

Regarding our speed in applying new technologies, surprising things happen. We were quick to adopt microprocessors in our machine tool and automobile industries and to invest this technology in our standard machine tool products.

This started in 1982, but it has happened much faster than I thought it would. Still, we have a major disadvantage in that we try to carefully analyze problems, and this takes time. We are quick to identify risks. For instance, if someone comes up

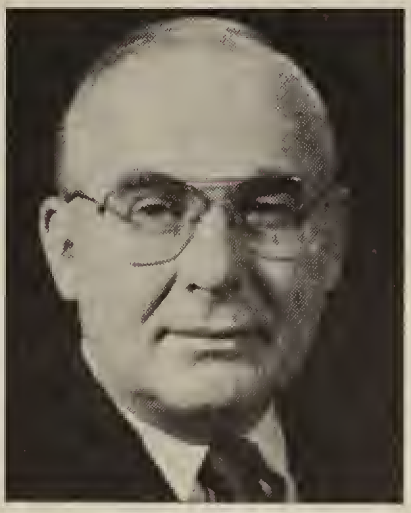
Continued on page 90

Five who honed strategic edge

BY ALAN ALPER
CW STAFF

NEW YORK — A variety of paths were pursued by five MIS executives honored here recently for innovative use of information systems that contributed to the attainment of their organizations' objectives.

The efforts of the winners included development of accounting, sales and inventory systems along with construction of data networks and standardization of data definitions. Also figuring in their work were such top-level concerns as organization building, architecture design and resource management.



Joseph T. Brophy

The Awards for Achievement in Managing Information Technology, sponsored by American Management Systems, Inc. (AMS) and Carnegie-Mellon University's Graduate School of Industrial Administration, went to:

- Joseph T. Brophy, senior vice-president, data processing, The Travelers Corp.
- Michael P. Cruskie, executive deputy commissioner, State of New York Division of Criminal Justice Services.
- C. Clinton Joyce, senior vice-president, Management Information Systems, Albertson's, Inc.
- Ron J. Ponder, senior vice-president, Information Systems Division, Federal Express Corp.
- Michael R. Zucchini, president, General Re Services Corp.

Walter Wriston, former chairman and chief executive officer of Citicorp, was the keynote speaker at the awards presentation. The ceremony, held at the St. Regis Hotel in New York, was attended by about 100 MIS executives. Wriston, regarded as a force behind the holding company's use of technology for competitive advantage, warned MIS executives that most of their current information systems need a broader focus to provide the foresight needed to chart strategic courses.

"Internal operations must be integrated with external market data if they are to be really useful in a rapidly changing environment," he said. "Trying to keep track of who your competitors are is almost a full-time job, but tracking not only what they are doing but what they are likely to do is becoming critical."

About 350 MIS executives were nominated for the awards by senior executives in their organizations, according to Charles Rossotti, AMS's president and chief executive officer. Winners were chosen by six judges: Carnegie-Mellon professors Charles H. Kriebel and Michael Prietula; AMS executives Timothy Matlack and Frank Nicolai; James H. Scott, director of

Continued on page 92

Pacific Bell charts merit pay course

SAIL sets direction for motivating, promoting, retaining DP pros

BY DAVID A. LUDLUM
CW STAFF

SAN RAMON, Calif. — Pacific Bell has designed a compensation plan aimed at retaining and motivating information systems professionals by basing pay on a combination of skills and job performance.

The plan, called Salary Administration for Information Leaders (SAIL), will not be implemented before early next year, according to Dennis Cavanaugh, a staff manager with the company's customer billing operations and one of seven members of the task force that developed SAIL. "We're doing a lot of preparation now and would continue doing that throughout the year," Cavanaugh said.

SAIL is intended to apply to all of Pacific Bell's roughly 3,000 information systems professionals, including supervisors and first-line managers. All of them are salaried; none are represented by unions.

The plan is being developed by a task force made up of one representative from each of the five technical job levels and two management job levels to which the plan will apply.

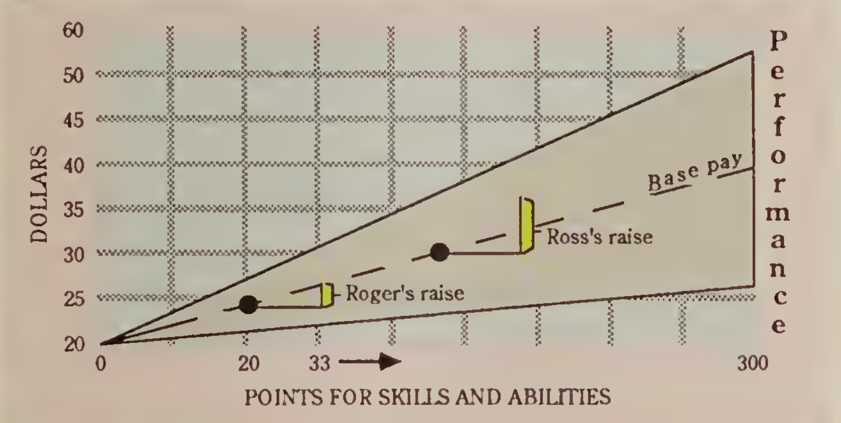
The effort, which began in March 1986, was prompted by a lack of specific standards for setting pay and several other factors, which include:

- Disenchantment with poor performers being paid as much as standouts.

Continued on page 93

"SAIL" compensation plan

Roger and Ross achieved the same improvement in skill level during the year, but outstanding performance brought Ross a greater percentage increase in pay in this hypothetical case



CW CHART:SUSAN ALDAM

BOOK REVIEWS

Stalking the elusive computer professional

Recruiting and Hiring the Computer Professional
By David J. Moore

It is hard to follow the field of information systems management and see a week go by without mention of a traditional, technically oriented information systems manager being replaced or superceded by a more business-oriented executive.

Along with some knowledge of accounting and finance, the general process of delivering a product and the larger environment within which a corporation operates — that business-oriented executive's tool kit of skills and techniques — is expected to include a grasp of personnel or human resources issues, to judge from such standards as the required curriculum of the Harvard Business School. (Take heart: It now also includes information systems.)

A command of personnel matters — especially recruiting and hiring — is particularly important to the upwardly mobile information systems manager because of the tight market for technically adept MIS professionals. The need can be compounded by a lack of exposure to the field on the part of managers who have devoted themselves to honing their technical knowledge. As David J. Moore contends in the preface to *Recruiting and Hiring the Computer Professional*, such skills are among the most important for a technical manager, but they are skills that have usually been acquired by trial-and-error with minimal formal training.

Even short of the importance of superior recruiting skills, managers need to understand basic procedures such as creating and maintaining the proper documentation for hires. So it is to be expected that a book like Moore's has something to offer.

It does, thanks to a broad scope, sound organization, a hands-on point of view and clear prose. "The aim of this book is to convince technical managers that the hiring of computer professionals is a matter of top priority and to impart techniques and skills that will make such hiring a reality," Moore writes, emphasizing his key point and describing his mission.

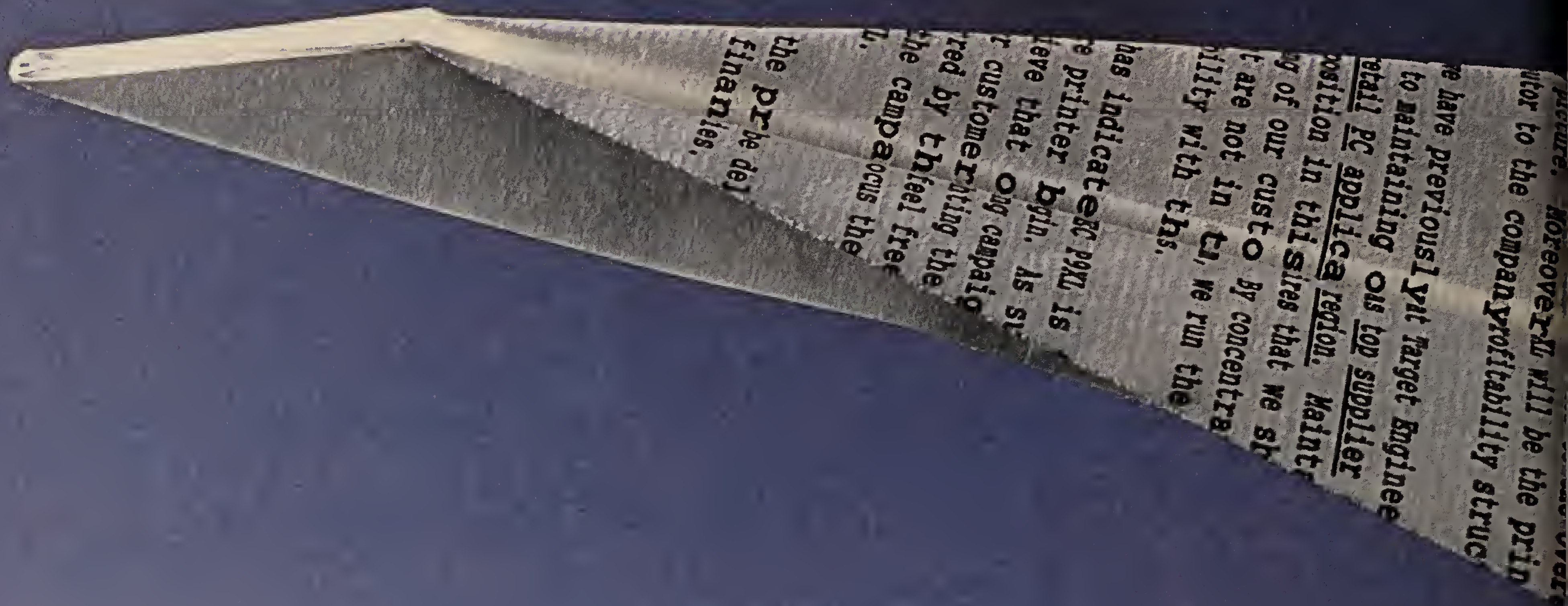
The trip is not without a bit of tough sledding, though. After a brief introduction that scopes out the recruiting and hiring territory through a vignette, then a look at the technical job market, Moore veers off on a bumpy, uphill run.

Titled "Employment as a Systems Process," the second chapter presents recruitment and hiring as a bewildering series of flow charts and decision trees likely to bring out atavistic tendencies on the part of technical managers trying to round themselves out.

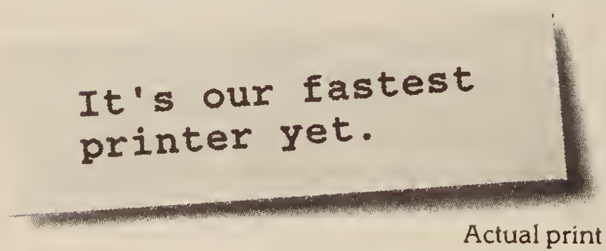
But Moore, president of Realtime Associates, Inc., a placement firm for computer professionals, gets back on a down-to-earth track for the rest of the book while maintaining a systematic approach to his subject. Subsequent chapters take the reader through key aspects of and alternative approaches to identifying job requirements, recruiting, screening candidates, interviewing, making the choice and extending an offer. And

Continued on page 90

INTRODUCING THE
YOU WON'T BELIEVE
TO THE AVERAGE



Fasten your seatbelts. The new Pinwriter® P9XL printer from NEC is about to take off.



It's our fastest printer yet.

Actual print sample from the Pinwriter P9XL printer.

It cruises at 400 characters per second in draft mode, 140 characters per second in letter quality mode.

Which means it can really make those business letters fly. In fact, no other 24-pin printer is faster.

And because it uses a 24-pin printhead and a multistrike film ribbon—the same kind that's used in typewriters and letter-quality printers—the P9XL also delivers better print quality than its competitors. It even prints in color.

But it's not limited to letters. The Pinwriter P9XL is a true multi-purpose printer that can fly through payroll, invoices, continuous forms, multipart forms—just about any business or office application.

Best of all, it's from NEC—the world's largest

C&C Computers and Communications

P9XL PINWRITER.
WHAT IT DOES
BUSINESS LETTER.

May 15, 1987
Mr. John Cavanaugh
Electronic Advantages, Inc
1411 New High Ridge Road
Omaha, Nebraska 56134
r Mr. Cavanaugh:
Regarding the recent elopment since our las
ussion, we feel that t opportunity for ran
TARGET ENGINEERING

manufacturer of 24-pin printers. The company that consistently offers you the highest reliability ratings in the industry. (You can expect your P9XL to run for five years before it might need a repair.)

So don't waste any more time. Fly down to your nearest dealer and ask to see the new Pinwriter P9XL. Or call NEC at 1-800-343-4418 (in MA, (617) 264-8635). Or if you prefer, write to NEC Information Systems, Dept. 1610, 1414 Massachusetts Ave., Boxborough, MA 01719.

NEC PRINTERS. THEY ONLY STOP WHEN YOU WANT THEM TO.

NEC

NEC Information Systems, Inc.

Europe gains

CONTINUED FROM PAGE 87

with a new product the first questions he is likely to be asked are "Do you have references?" and "How many items have you sold already?"

That's one of the reasons IBM is so successful in Germany, where it has some product areas with market shares of more than 50%. It is so reliable a company that people feel "Don't take any risks — buy IBM."

I have another example. A friend of mine offered a small device for about $50 to our defense department and he almost did not get the contract because Siemens AG had offered the same item for about $500. He was not taken seriously, and I think that is the attitude in Germany and to some extent in France as well.

Turn weakness into strength

But if you translate analysis into careful, systematic thinking, this weakness turns into a strength. You can just turn it around — instead of being slow to apply technology, the other side of the coin is integrating systems, careful thinking.

On the other hand, if you look at the small domestic markets, we have to include everyone, so that weakness also translates itself into a strength — suddenly Europe surpasses the U.S. and Japan in developing standards.

A case in point is the American personal computer that is not integrated into the main system. In small business systems of the Nixdorf Computer Corp. type, both hardware and software are offered — that's a typical European or German product. You offer a strong solution, the organizational solution, the software and the hardware. That's where Europe is strong.

Europe is quite advanced in integrated banking systems. Two years ago when Bankamerica Corp. announced that it would spend hundreds of millions of dollars to develop its software systems in banking, I had a conversation with a Swiss banker. I told him that Bankamerica was doing grand things, and he almost laughed at me. He said Europe had had those systems for five years or more.

In the area of sophisticated banking systems reaching all departments and including all functions on a worldwide basis — cash management, account management and so forth — I think there the Americans can learn from us in Europe.

I believe it's a similar situation in retailing. Recently I read in a newspaper that Nixdorf had won a major contract with the U.S. for point-of-sale systems. That is an indication of one place where you can expect great things from Europeans.

Reaching everyone

Speaking of strengths, we learn that because of our small domestic markets, we need to reach everyone. That is why we have International Standards Organization activities for communications standards.

At first it was the domestic market, but this is now becoming a European market, and you can be sure that although it will take some time, we will have Integrated Services Digital Network, videotex and European widebands. At the moment, it's scattered in different countries, but we will have European standards and European markets.

I think these are the major underlying differences, and I think that it is important for you to understand these weaknesses translating into strengths.

We have a common problem, though. Technology and its use are far apart. We have expectations in the clouds, technology somewhat lower — in the mountains — and the user down among the pitfalls and holes in the road. I think that's the reality. When you — and the end user — read in the American magazines what's going to happen to your paging system and your risk function, and then you see what is really going on, you are down there on the rough road.

Xerox and IBM
read it and weep

NBS Southern gives you
80 PPM high quality
non-impact printing at
less than 1½¢ per page

The Mercurion 1/80

IN THE BEGINNING . . .

Your printer choices were limited to the "big guys". But times change, don't they? Now, happily, you have some options . . . and to meet the ever increasing demands of your data center users at the **lowest possible cost**, you need to take advantage of every opportunity to improve the cost/performance of your data center printing operations. Yes, now you have the "option" of **more** capability, **more** flexibility, **more** connectability and at 80 pages-per-minute . . . All for the lowest entry cost to non-impact printing currently available. The **NBS Southern Mercurion 1/80** . . . Simply the most cost-effective and fully featured non-impact printer on the market today.

NOW . . . DARE TO COMPARE
XEROX'S LATEST ENTRY WITH
THE **MERCURION 1/80**

	MERCURION 1/80	XEROX 4060
• Speed (Pages-Per Minute)	80	60
• Ion deposition imaging	YES	YES
• JES 2, JES 3 exit	YES	YES
• 8½" x 11" **and** 8½" x 14"	YES	NO
• Across-the-board support for DOS and VM users creating **and** printing forms	YES	NO
• DEC/VAX, Data General, Prime, Tandem, and others	YES	NO
• Long line (2000 feet)	YES	NO
• Positive job separation	YES	NO
• All points addressability (APA) graphics	YES	NO
• Automatic graybar facility	YES	NO
• Superior forms creation software with "round corner" capability	YES	NO
• Multiple forms overlay	YES	NO
• Over 400 satisfied users of ion deposition imaging	YES	NO
• Service **today** in over 50 cities	YES	NO
• **Complete at less than $60,000**	YES	NO

Yes, our more famous competition and others not so famous have now officially "endorsed" Mercurion's proven ion deposition imaging technology — a technology proven superbly efficient and highly reliable in over 400 user installations of Mercurion products in the U.S. and abroad. We welcome this competition and invite your careful comparison — feature by feature, function by function. Compare for **total system compatibility** . . . with no software changes (IBM under VM, DOS and MVS), DEC/VAX under VMS and others. You will find that the Mercurion 1/80 is **the printer** that meets the needs of both the IBM world and non-IBM user. Compare for high resolution all point addressable (APA) **graphics**. Compare for **automatic forms creation,** with round corner capability for more attractive reports. Compare for 2000 foot **long line capability** . . . and a host of other unique, cost-effective Mercurion features which have been field proven in demanding user environments over the past three years.

Isn't it time that you really considered the "options"? Isn't it time that you decided to advance to the most cost-effective cut sheet printing machine available today . . . the Mercurion 1/80.

NBS
Southern, Inc.

Corporate Headquarters
100 North Belcher Road
Clearwater, FL 33575
(813) 441-1981
Outside Florida (800) 327-5602
Telex 522135 • FAX (813) 447-3012

Xerox is a registered trademark of Xerox Corporation.
DEC, VAX and VMS are registered trademarks of Digital Equipment Corporation.
IBM is a registered trademark of International Business Machines Corporation.

Investigate our VAR/Distributor Program

Mail to: **NBS Southern, Inc.**
100 N. Belcher Road
Clearwater, FL 33575

Name ______________________
Title ______________________
Company ______________________
Address ______________________
City ____________ State ________ Zip ________
Telephone (   ) ______________________

Computer pros

CONTINUED FROM PAGE 87

Moore does not stop there, following with chapters on smoothing the arrival of new employees and on retaining them.

In following the hands-on approach, the chapters include items such as sample forms for conducting and recording telephone interviews with candidates and their references and a sample chart and scoring system for comparing candidates. Furthermore, three appendices contain various checklists, a collection of job descriptions and laws and regulations of the Equal Employment Opportunity Commission.

And there is more — chapters on contemporary issues such as relocation and dual-career paths; communications between technical and personnel organizations and the use of data bases and expert systems in hiring.

Hardcover, $32.95, 254 pages, ISBN 0-442-26443-7, by Van Nostrand Reinhold Co., New York, N.Y.

DAVID LUDLUM

The MIS Request for Proposal

By Michael Asner

Examples from "the best-run companies" — 14 actual documents used by major firms to solicit bids for software, equipment and services. The reference work is geared toward managers who prepare requests for proposals ranging

Continued on page 92

Tandon just expanded the world of compatibility.

70MB

And, all at a price that has become a Tandon trademark. At $3,699* it's 30% to 40% less than our major competition.

We have just expanded our line of AT-compatible microcomputer workstations with the addition of the powerful PCA-70. With its massive 70MB of Winchester hard disk storage and super-fast access time, even the most complex UNIX® applications and networking tasks are a snap.

When you choose one of the other four Tandon AT-compatibles the values become even more convincing. From the 1.2MB PCA-1 to the 40MB PCA-40, all now come with standard features such as serial and parallel ports, plus 1MB of memory on the system board.

But a low price doesn't mean you have to sacrifice quality. Tandon microcomputers are engineered for performance and reliability by a manufacturer who has been an industry leader for over a decade.

For a Tandon Dealer nearest you, call toll free: **1-800-338-4555.** In California call: **1-800-237-1735.**

Tandon
Price. Selection. Quality.

Please send me your Tandon Fact Pac, a comprehensive set of literature and product reviews:

Name ____________________

Position ____________________

Company ____________________

Address ____________________

Telephone ____________________

Tandon Computer Corporation
405 Science Drive
Moorpark, CA 93021
805/378.6104

CW 6/1

*Monitor not included

UNIX is a registered trademark of AT&T Bell Laboratories.

Strategic edge

CONTINUED FROM PAGE 87

technology development at Procter & Gamble Co.'s management systems division; and John C. Reece, executive vice-president and senior information technology partner at Strategic Planning Associates, Inc. in Washington, D.C.

The Travelers' Brophy was honored for his role in creating an integrated systems organization that has enabled the firm to cut overhead by capturing data at the source and transmitting millions of daily business transactions to central data bases. He also helped establish a communications network that provides on-line access — by independent agents — to customer and policy information. The network has helped the $16 billion financial services firm improve customer service.

Brophy has been instrumental in putting desktop computers on the desks of more than 3,700 of the Travelers' independent agents, providing access to any of the company's 3,600 customer and policy information data bases.

Cruskie won his award for implementing two major criminal justice systems for New York state: the Systems Improvement for Enhanced Community Safety Program and the Statewide Automated Fingerprint Identification System.

Cruskie was credited with developing standard data definitions for defendants and standard forms for tracking arrests and warrants and developing microcomputer-based systems for tracking warrants and managing jails and implementing the first phase of a statewide criminal justice data communications network.

Albertson's Joyce was honored for building an MIS organization and systems architecture from scratch that contributed heavily to cost reductions. Albertson's, a $5.4 billion supermarket chain, spends an average of 0.14% of sales on its MIS operations, compared with an industry average of 0.37%, which enables the firm to save an estimated $12 million a year.

Among Joyce's accomplishments are building a sales information system that enables the company to closely monitor sales performance in its stores, creating an integrated accounting and reporting system to help control expenses and monitor stores' financial performance and establishing a communication network connecting the company's warehouses, division offices and food stores, including point-of-sale systems.

Federal Express's Ponder was selected for his role in developing and implementing the Cosmos IIB Tracker System, which enables the air courier firm to track packages at key points along the delivery route. The system enables the $2.6 billion firm to capture air bill numbers and other information such as the package's recipient, destination and size at the time of pickup. Ponder was credited by the judges with leadership in conceiving the systems approach and managing the resources to deliver it. In addition, he was recognized for helping advance Federal Express's competitive position within its industry.

General Re's Zucchini received his award for developing a system that eases time constraints and information burdens placed on its insurance underwriters and clients. The firm's Communications Network for Electronic Reinsurance (Confer) enables its 300 underwriters and sales personnel to quickly determine whether the company has ever insured a prospect, immediately produce all reinsurance quotations and coverage documents — a process that used to take days — and automatically generate premium and accounting entries.

Confer helps clients by rapidly identifying reinsurance coverage, electronically sending them historical and new business documents, providing an automated inventory of reinsurance coverage and producing ad hoc user-defined reinsurance reports.

Stalking

CONTINUED FROM PAGE 90

from feasibility studies to complex turnkey installations.

Loose-leaf, $95, 170 pages, by Kirkley Communications, Nyack, N.Y.

Computer Security

By John Carroll

Reducing the level of computer insecurity by using the latest technologies, common sense and traditional security practices.

Hardcover, $32.95, 446 pages, ISBN 0-409-90032-X, by Butterworth Publishers, Stoneham, Mass.

The Software Encyclopedia

By R. R. Bowker Co.

More than 1,000 micro programs developed in the last year are included in this two-volume sourcebook.

Hardcover, $125, 1,881 pages, ISBN 0-8352-2090-7, by R. R. Bowker Co., New York, N.Y.

Advanced Dbase III Plus

By Miriam Liskin

A detailed exploration of how to make the most out of Ashton-Tate's package.

Paperback, $21.95, 885 pages, ISBN 0-07-881249-6, by Osborne McGraw-Hill, Berkeley, Calif.

Publishers wishing to have their books considered for review can direct books, prepublication galleys, press releases, catalogs or other information to George Harrar, Book Review Editor, Computerworld, P.O. Box 9171, 375 Cochituate Road, Framingham, Mass. 01701.

High Tech Advertising. When the

COLUMBUS, OHIO • 9:35 A.M.

After three years of development, the PC-based financial planning product of a multinational U.S. company is ready to be marketed in Western Europe and the Pacific Basin.

With a limited budget, the marketing director needs to develop an advertising plan that delivers maximum impact in targeted international markets. First, he needs to know his best prospects, then, how they view his company's products, and finally, what competition he will face.

His solution: Call **International Data Group.**

FRAMINGHAM, MASSACHUSETTS • 9:45 A.M.

The marketing director calls Frank Cutitta, director of **IDG Communications International Marketing Services.**

Cutitta decides that initial research is needed. He immediately contacts Mike Raimondi, director of Database Services for **International Data Corporation's Global Data Resources.**

Cuttita and Raimondi map out a comprehensive **QuikSurv** telephone survey which will poll both MIS professionals responsible for selecting and purchasing similar products in large corporations, and PC end-users who will actually use the product in Europe and Asia.

The marketing director authorizes the study.

E-Mail assignments are quickly sent to IDC's international offices in London, Paris, Munich and Sydney.

SYDNEY, AUSTRALIA • 11:30 A.M.

Cutitta discovers strong competition in Australia where similar but lower-level PC-based financial products are already on the market. He contacts Alan Power, vice president of **IDG Communications' Pacific Region** and general manager of *Computerworld Australia*.

Power recommends a two-tier advertising campaign highlighting the product's technical breakthroughs, and stressing the program's ease-of-use and strong local sales support.

LONDON, ENGLAND • 2:00 P.M.

At the request of Cutitta, Philip de Marcillac, director of **IDC's European Research Center,** prepares a forecast of PC-based financial planning product sales to provide critical information as the team determines how to best reach key corporate targets.

Pacific Bell

CONTINUED FROM PAGE 87

- A "level consciousness" arising from numerous pay levels. The new plan accommodates individual variations in pay within a single, broad range.
- The fact that workers advance to the top pay level for their jobs in two to four years, lessening incentive to excel after reaching that level.

Under the plan, a worker's pay is determined primarily by mastery of skills identified as important to the organization. Base pay for possession of a given skill level rises to reflect increasing depth of knowledge or ability. In addition, the employee can earn a premium through outstanding performance.

The system is intended to operate in the following way:

- A worker is awarded points on the basis of mastering skills identified as valuable to the organization; the points vary for different skills, depending on importance. Every year managers re-evaluate which skills are relevant and to what degree.
- For each worker, points for a skill are multiplied by a measure of the worker's proficiency at it. The resulting figures are totaled to derive an overall skill level. That level determines a worker's base pay according to a fixed scale (see chart page 87).
- Workers' pay is adjusted annually. The base pay for a worker with a given skill level rises with time because the worker's command of it, reflected in the depth measure, is considered to increase. With no additional skills, a worker generally would get a modest annual raise; by acquiring new skills, the worker would get a larger raise.

However, a worker could earn more than his base pay for a skill level, to a limit, by showing sustained, outstanding performance, which is determined through an annual review. So by improving performance, the worker also stands to win a greater-than-average percentage increase in pay.

Some employees are apprehensive about the subjective nature of assessing performance through reviews, Cavanaugh said. "As soon as you start talking about something that has some subjectivity in it, people become concerned. It is very difficult to come up with a skills assessment that is not too time-consuming and is objective."

A particularly sticky issue is the possibility of a worker's pay declining. Theoretically, that could happen with changes in the skills identified as relevant, with diminishing command of a skill from lack of use or with a drop in the level of a worker's peformance.

But Cavanaugh suggested the company is taking pains to avoid pay cuts.

When changes in the value assigned to skills leaves a worker with a lower rating, he would be given time to acquire new skills in order to recover, Cavanaugh said. Only after failing to do so might his pay drop.

No drop in pay

Similarly, pay would not be lowered because of implementation of SAIL; if a worker's pay is considered too high for a particular skill level, then an opportunity is to be given to raise the level to bring it in line with the worker's salary.

"If they do not exercise those opportunities, we're going to have say, 'OK, your pay is at risk, and we're going to have to make some adjustment,' " Cavanaugh said.

The question of atrophy of a skill from lack of use has not been settled; while it may lead to lowering the proficiency level of a worker's skill, it would not lead to denying credit for the skill entirely, Cavanaugh said.

Finally, if a worker's level of performance drops, his pay should at most remain level — perhaps failing to match increases given co-workers — except in cases of clearly unsatisfactory performance, when it might fall. "An extreme drop in performance could affect it," Cavanaugh said. "If performance is at a high level and drops to a reasonable level, we do not see pay going down."

The plan calls for providing workers with the time to acquire and demonstrate additional skills and for providing managers with training in reviewing workers' performances, including refresher courses.

The plan is also meant to complement an active career development program geared toward providing workers with opportunities to pursue individual goals. "We like to think of that as the major component," Cavanaugh said.

CALENDAR

JUNE 7-13

Adpac Corp.'s Annual Users Group Conference. Atlantic City, June 7-9 — Contact: Adpac Corp., Users Group Conference, P.O. Box 3337, San Francisco, Calif. 94119.

1987 Federation of Conferences on Information Systems. Washington, D.C., June 8-10 — Contact: National Council for Education on Information Strategies, P.O. Box N, Wayland, Mass. 01778.

Seventh International Conference on Decision Support Systems. San Francisco, June 8-11 — Contact: Julie Eldridge, DSS-87, The Institute of Management Sciences, 290 Westminster St., Providence, R.I. 02903.

World is bigger than your budget.

FRAMINGHAM, MASSACHUSETTS • 4:30 P.M.

Cutitta and Raimondi meet with IDC's QuikSurv's Ken McPherson and Judy Danielson to summarize the survey findings.

Sheryl Merchant, IDG Communications International Marketing Services sales and marketing support manager, uses IDG's global E-mail Network to check foreign currency exchange rates and closing dates for all international magazines.

UNITED STATES, EUROPE, ASIA • 4:45 P.M.

Cutitta initiates a global conference call to review final recommendations with IDC's regional offices in Sydney, London, Munich, Hong Kong and Framingham. His plan is to target MIS professionals by using *Computerworld Australia, Computerworld Asia, Computerwoche, Computerworld Italia* and *Computer News* in England. The PC end-user campaign will stress product documentation, reliability and service, and break in *PC World* editions in England, France, Germany and Australia.

COLUMBUS, OHIO • 5:30 P.M.

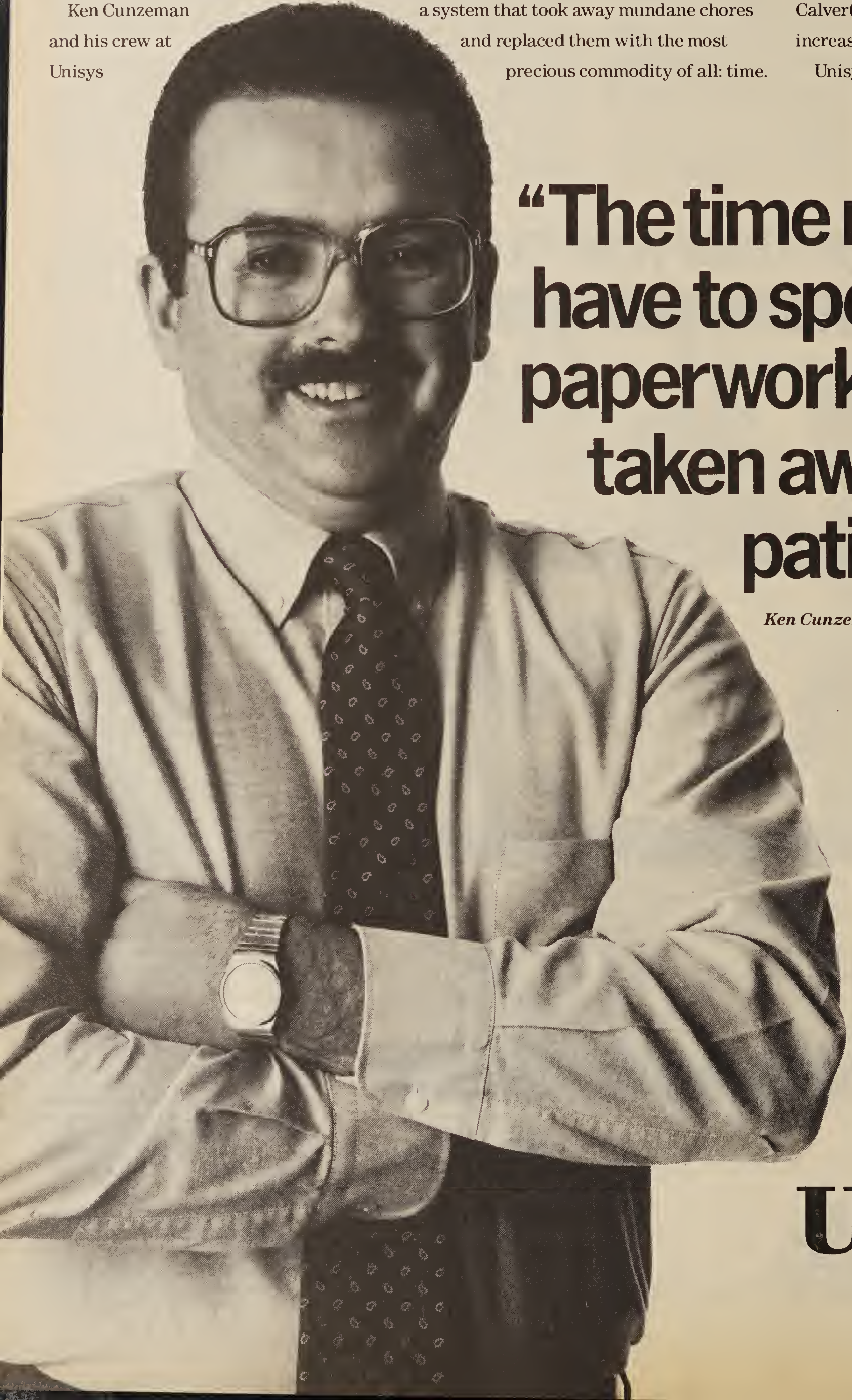
The marketing director accepts the IDG recommendation and notes that the media plan prepared by IDG will penetrate all target markets within budget restrictions. He gives Cutitta a final commitment for advertising space in the selected IDG magazines. All the ads will be placed centrally through IDG/IMS in the U.S.

His new product campaign will break in three weeks.

IDG
INTERNATIONAL DATA GROUP

85 magazines
28 research centers
16 languages
1 world.

IDG. The World's Leading Provider of Information Services on Information Technology.
ve Speen Street, Framingham, MA 01701 • (617) 875-5000 • *Operating Companies:* International Data Corporation (Research) • IDG Communications, Inc. (Publishing)



Maryland's Calvert Memorial Hospital wanted the same things all hospitals want today. Less time spent on paperwork and more time spent with patients.

Ken Cunzeman and his crew at Unisys thought they could help. The Unisys team was composed not only of computer experts, it included nurses and hospital managers as well.

Together with Calvert, they implemented a system that took away mundane chores and replaced them with the most precious commodity of all: time.

Today, a nurse can order a lab test, inform other departments, and make sure that all changes have been recorded automatically.

Needless to say, there was an increase in productivity. Perhaps more important for Calvert Memorial, there was also a big increase in smiles.

Unisys and healthcare. The power of^{2}.

"The time nurses have to spend on paperwork is time taken away from patients."

Ken Cunzeman, Marketing Manager, Unisys.

UNISYS

The power of^{2}

COMPUTER INDUSTRY

INDUSTRY INSIGHT

Clinton Wilder

Lessors wed, far from dead

Sometimes, the computer industry "experts" end up being right for the wrong reasons.

As tax reform legislation wended its way through the U.S. Congress in 1985 and 1986, the experts looked at the computer leasing industry and shuddered. The investment tax credit — the foundation on which the independent leasing industry built its growth in the 1980s — was headed for the grave.

Users would lose the No. 1 tax advantage for leasing, and a bloody shakeout in the computer leasing industry would result. Independent leasing firms, strapped for business and finding it difficult to sell lease deals to investors, would consolidate like crazy in order to survive.

Bucking predictions

Well, a funny thing happened on the way to the funeral. Computer leasing, for a variety of reasons *including* the new tax laws, remained as popular as ever with MIS directors. And the computer leasing industry, if one ignores Comdisco, Inc.'s sometimes disastrous foray into risk arbitrage, has continued to prosper in most cases.

But the experts were right about one thing: The industry *is* consolidating.

Last week, the industry saw the attempted merger of two of the largest independent lessors as Continental Information Systems Corp. (CIS) in Syracuse, N.Y., attempted to buy out CMI Corp. in Bloomfield Hills, Mich., for $50 million. Although CMI President Ed Cherney is attempting to block the deal with a federal lawsuit, CIS's intentions are only the latest example of a burgeoning industry trend.

The attempted CIS-CMI marriage follows, in the past few months, the almost $300 million acquisition of Equitable Life Leasing Corp. by mortgage banking concern Lomas & Nettleton Financial Corp.; the buyout of Greyhound Capital Corp.

Continued on page 98

Seagate drives into the future

Shugart looks at 3½-in. disks, PS/2 and staying on top in changing game

The OEM marriage between Seagate Technology and IBM has always had peaks and valleys. IBM is still Seagate's largest customer, but Big Blue sales accounted for only 22% of Seagate's revenue for the quarter ended March 31. Furthermore, with IBM using its own disks in its new Personal System/2 line, there was some question as to how strong the Seagate-IBM relationship would remain.

Just recently, however, Seagate announced it would be supplying IBM with two lines of 5¼-in. thin-film media hard disks — the 44M-byte ST 4053 and the 80M-byte ST 4096. Although neither Seagate nor IBM would discuss this agreement in any detail, analysts speculate that IBM will be using the Seagate disks for either existing or unannounced PS/2 models. The deal was valued by some analysts at about $200 million.

In a recent interview at Seagate's Scotts Valley, Calif., office, *Computerworld* West Coast correspondent James A. Martin talked with Alan F. Shugart, Seagate's colorful chairman and chief executive officer, about Seagate's relationship with IBM, the future of the hard disk drive industry and new storage technologies.

In February, you announced your first rigid disk drives in the 3½-in. format. Do you have any OEM contracts for those disk drives yet?

None that we've announced. I don't want to be misleading with that statement, but we haven't delivered any evaluation units yet. The product is scheduled for shipping in July.

Are you trying to be more independent of any one customer like IBM — to have a broader base of customers?

Alan F. Shugart

We've never turned down an order from anyone. It would never be a conscious effort to reduce our quantity of drives supplied to any customer.

Do Seagate's disk drives use mainly the thin-film media technology today?

The majority of the disk drives we're shipping now still use the older oxide technology. All new products announced in the last year-and-a-half use the thin-film media, but the volume of those hasn't reached the volume of our older disk drives.

Does that make those disk drives incompatible with the oxide technology 3½-in. hard disk drives used in the PS/2?

From a technical sense, perhaps, but from a user's sense, no one knows the difference. IBM hasn't ever, with one minor exception, used disk drives with thin-film media. They've been afraid of it because it's a new technology.

However, there's so much information available on oxide disks that you can make long-range projections.

There's not enough known about the thin-film media yet. Over a period of time, there will be enough accumulated that technologists can make some projections for long-term reliablity.

Does that mean that in the near future, your 3½-in. hard disks could be a candidate for the PS/2?

Sure.

How likely is that to happen?

I don't know. Call IBM and find out.

What do you see as the next storage generation after 3½-in. disk drives? What about integrated-circuit cards using semiconductor chips for memory?

I don't see semiconductor technologies entering that never-never land. There's a big gaping hole in the memory hierarchy between semiconductor and disk memory. Historically, every advance of semiconductors in cost,

Continued on page 101

Compiler maker sold to rival

BY JAMES A. MARTIN
CW STAFF

SAN JOSE, Calif. — Ryan-McFarland Corp., one of the best known and longest established Cobol and Fortran language software suppliers, is expected to be acquired by an Australian competitor.

Austec, Inc., the San Jose-based subsidiary of Austec International Ltd. in Melbourne, Australia, said it will acquire Ryan-McFarland for an undisclosed amount. The acquisition will reportedly be finalized later this month.

Ryan-McFarland, based in Rolling Hills Estates, Calif., is to become a wholly owned subsidiary of Austec and will retain its RM product line. Because both companies offer similar products, there will be some product consolidation in the future, according to Austec's Chairman and Chief Executive Officer Les McNeill.

For example, both companies offer Cobol 85 language compilers, but eventually the two will be merged, in essence adding Austec's networking capability to Ryan-McFarland's product, McNeill said. He added that sup-

Continued on page 98

Inside

- Corvus CEO resigns. Page 101.
- Sterling Software announces 22% revenue drop for second quarter. Page 103.

IBM sues Rodime, challenges right to 3½-in. drive patent

BY JAMES A. MARTIN
CW STAFF

WASHINGTON, D.C. — In an effort to protect its 3½-in. disk drives in the Personal System/2, IBM has filed a lawsuit here challenging Scotland-based Rodime PLC's attempts to defend a patent on 3½-in. Winchester disk drive technology.

Earlier this year, Rodime, a leader in smaller size hard disks, filed suit against Miniscribe Corp. and Conner Peripherals, alleging patent violation. Rodime maintained that it was the first to develop the 3½-in. disk drive technology that vendors such as Miniscribe and Conner manufacture.

IBM filed its lawsuit to prevent a similar patent infringement suit from Rodime, according to IBM attorneys.

IBM recently began producing 3½-in. disk drives for use in its PS/2 line of personal computers.

IBM is seeking a court ruling that Rodime's patent is invalid.

In addition, IBM entered the litigation fray out of concern that other 3½-in. hard disk drive vendors might not be aggressively fighting Rodime's patent challenge, according to Lee Elizer, president of Peripheral Strategies, Inc., a Santa Barbara, Calif., research firm.

Rodime chances slim

Although most industry observers say they believe Rodime's chances of having its patent upheld are slim, IBM does not want to take the chance of depending on one company — Rodime — as a second-source supplier if the patent is recognized, Elizer added.

IBM's lawsuit charges that Rodime's 3½-in. disk drive patent is invalid and unenforceable and also calls the patent "vague and unoriginal."

Miniscribe and Conner have denied any patent violations. A Miniscribe official said his company would not comment on the suit, while Conner and Rodime officials were not available for comment.

Separately, Rodime recently lost a sizable portion of its Apple Computer, Inc. disk drive business to Miniscribe. Miniscribe recently signed an OEM deal to supply Apple with up to $83 million worth of 3½-in. Winchester disk drives for the Macintosh SE.

Our depart
systems do
anybody ou

Not even Wa

Honeywell Bull's ONE PLUS departmental systems really do have something for everyone.

For your top management: ONE PLUS can actually enhance the value of investments in IBM and Wang systems by tying them together through our unique communication capabilities.

For your department heads: ONE PLUS offers fully integrated departmental computing, including office and data processing, Transaction Processing, Business Graphics, Electronic Mail, and Document Translation.

For your end users: ONE PLUS means access

Customers are more imp

mental
n't leave
t.

ng or IBM.

to the corporate information they need to do their jobs better. In a format non-programmers can work with.

For your MIS people: ONE PLUS is a wonderful way to end applications backlogs, while still maintaining control of the database.

To put it to work for you call 1-800-328-5111, ext. 9712, or write Honeywell Bull Inc., MS440, 200 Smith Street, Waltham, MA 02154.

Honeywell Bull

ortant than computers.

Compiler maker

CONTINUED FROM PAGE 95

port for all products will continue unchanged.

Although formerly competitors, the two companies will create a single, stronger company with little overlap, said David E. McFarland, vice-president of Ryan-McFarland.

"It's a natural fit," he said. "We have a strong compiler product, they have a strong network capacity on theirs. We've been strong in OEM and distribution but not in marketing and sales, while the reverse is true for Austec. Also, we haven't sold much to government or the Fortune 500 accounts, and Austec is strong in those areas.

"The two companies will succeed better together than they would have on their own," McFarland added. He said Ryan-McFarland has been looking to be acquired since January, in hopes of bolstering its marketing and sales organizations. "It was time to put together a first-class sales and marketing organization and Austec seemed the way to do it," McFarland said.

The combined companies said they are expecting revenue of $25 million this year and sales of $45 million in 1988. An initial public offering of stock in the combined firm is planned for mid-1988.

The company will continue operating as Austec, Inc., and there have not been any personnel changes planned. Although there is likely to be some overlap in areas such as corporate accounting, there are no plans for staff reductions at this time, Austec's McNeill said.

Ryan-McFarland's research and development and sales and marketing functions will be integrated with Austec's, and Ryan-McFarland's facilities in Rolling Hills Estates, Austin, Texas, and London will be maintained as they are currently.

Ryan-McFarland was founded in 1970. The firm claims to have written Cobol and Fortran compilers for more hardware environments than any other vendor. Its products include RM/Fortran, an ANSI 77 Fortran compiler for microcomputers.

The combined companies said they will have a user base of some 600,000 and a distribution network of 425.

IBM COPIES.
25¢ EACH.

For the first time, you can get high quality color hardcopy from all your IBM graphics systems. In a matter of seconds. For just a few pennies each.

The CH-5300 color hardcopier connects directly to your IBM hardware via our video interface. So you don't have to write any software. Plus you can connect up to four sources at one time. Or network the CH-5300 on a 3274-controlled system.

With the CH-5300, you'll work with up to 4,912 colors (not just 8). And you can count on seeing crisp, clean lines and smoothly shaded solids. So your screen images are accurately reproduced on every copy.

What's more, you'll get all this on paper or film. A or B size. In as little as 45 seconds.

So look into the Seiko CH-5300. You'll see the best IBM copies to come your way for just a quarter.

Call Martin Nelson at (408) 943-9100 today.

SEIKO INSTRUMENTS

© 1987 Seiko Instruments USA, Inc. IBM is a registered trademark of International Business Machines Corporation. Visuals courtesy of CADAM, Inc. and Motorola.

NCF announces new members

CHELMSFORD, Mass. — Unisys Corp., National Advanced Systems Corp. and Lotus Development Corp. were among 19 vendors announced last week as new members of the Network Computing Forum (NCF), the Apollo Computer, Inc.-sponsored consortium for distributed computing development.

NCF, formed in March, now has 50 members in the vendor and academic communities. It will hold its first technical and organizational session this week in Cambridge, Mass. Topics are slated to include the X-Windows system environment, Apollo's Network Computing System and SQL.

NCF also announced that it has become an associate member of the Corporation for Open Systems.

Lessors wed

CONTINUED FROM PAGE 95

by Bell Atlantic Corp.; the purchase of a minority interest in software leasing pioneer Software Funding International, Inc. by lessor and computer parts broker Dataserv Computer Maintenance, Inc. (which itself was purchased last year by Bell South Corp.); and a slew of much smaller leasing industry mergers.

This has all occurred not against a backdrop of disaster but within an industry that, in many ways, is healthier than ever. There are many reasons, some of them macroeconomic in nature, but two stand out: the industry's move away from all-IBM mainframe leasing and the alternative minimum tax.

Corporate auditors across the U.S. have discovered that because of the alternative minimum tax, there is often a significant bottom-line benefit to carrying an operating lease as a corporate expense rather than accounting for a purchased computer as a corporate asset.

Meanwhile, more and more MIS types are using this formula for Digital Equipment Corp. hardware, private branch exchanges and other big-ticket telecommunications gear. Third-party leasing concerns that have diversified to write leases on DEC and communications equipment are reaping the benefits.

So why did the experts turn out to be so right, for all the wrong reasons, about leasing industry consolidation? Because many of the same advantages of consolidation are just as prevalent in a strong market as in a weak one.

For one thing, leasing outfits are attractive business prospects for deep-pocketed acquirers like the regional Bell holding companies. But while the leasing market is strong, its competitiveness — which has always been on the cutthroat side — has increased.

Despite strong demand, lease rates have remained low, and IBM's renewed aggressiveness in remarketing just adds fuel to the fire.

There's plenty of hotly contested business out there, and companies seem to feel that growth by merger will help them get more of it.

Wilder is *Computerworld's* senior editor, computer industry.

TIMEPLEX WILL ANNOUNCE...

JUNE 23rd 1987

Timeplex is the acknowledged worldwide market leader in global, integrated T-1 data/voice business communications networking. We are a New York Stock Exchange company with $146 million in assets and 17 record-breaking years in business.

On June 23rd, Timeplex will announce a telecommunications networking architecture which could change the course of your business. If you are a senior manager or executive in telecommunications, data communications or MIS, you need to attend.

Set aside this date. To reserve your place, send in the coupon below. Seating is limited, so make your reservation as soon as possible.

Timeplex®

Timeplex, Inc.
Corporate Center
400 Chestnut Ridge Road
Woodcliff Lake, NJ 07675

Announcement Sessions are Being Held Simultaneously on June 23, 1987 in Atlanta, Chicago, Dallas, Detroit, Los Angeles, New York, Philadelphia, San Francisco, and Washington, D.C.

☐ Yes, I wish to attend the ____________________ session.
☐ I can't attend, but send me information on the announcement.
(You may affix your business card.)

Name ____________________
Title ____________________
Company ____________________
Address ____________________
City ____________________ State ________ Zip ________
Telephone No. (   ) ____________________

Don't Be Fooled By Imitation Session Managers

With all the MVS and VM session management systems that are available today, it's easy to become confused. **TPX** (Terminal Productivity Executive) is the forerunner in session management. Some of its features have been imitated—others can't be. Today, more than 800 Duquesne Systems customers benefit from our strong commitment to **TPX** support and development. **TPX** is setting the direction for network and terminal performance products. It is the original member of our Network and Terminal Productivity Group—a group that includes Network Access, STX (SNA to X.25), and NetSpy. Together, they help you meet existing and anticipated network performance needs. To find out why 800 sites chose **TPX** as their session manager, call us today at 800-323-2600 to arrange a FREE 30-day trial.

TPX

DUQUESNE SYSTEMS

Duquesne Systems Inc. • Two Allegheny Center • Pittsburgh, PA 15212 • (412) 323-2600

Seagate

CONTINUED FROM PAGE 95

speed and size has helped the disk-drive industry. It has made them more usable. So I don't see chips supplanting disks — not in my lifetime, anyway.

What about optical storage?
We're working on some projects in that area in our Singapore plant. We're working on a high-speed compact disk/read-only memory [CD-ROM] player with increased access time as well as a rewritable CD-ROM disk. But those are basically experiments, and there are no specific products planned from those projects at this point.

Whom do you consider to be your main competitor?
IBM is both our biggest competitor and our biggest customer. That's a very healthy relationship. It keeps us honest, driving, reducing costs and advancing technology.

Some analysts say that in the past, your company has not been able to turn around fast enough to keep up with new technology.
That's a misconception. We're a volume manufacturer, so the technology we execute is different than what they might be working on in research and development. It has to be a big enough market before we will get into it. Someone like Maxtor Corp. has developed a nice niche for themselves in the very high-end hard disk drive area, but there's not enough volume for us there right now. Just because we don't manufacture it doesn't mean we can't do it.

It's also been said that Seagate has not always been able to keep manufacturing up with product demand.
Except for the December 1986 quarter, we've always prided ourselves on having more capacity than we needed so that we can react quickly to customer demand. In that quarter, we were on allocation for a couple of our disk-drive products because demand was higher than our capacity, but we soon caught up. We have production capacity now that exceeds what we're building, and that's the way we want to keep it.

What do you see as the most important issues in the industry today to your company, and how is Seagate addressing them?
I don't think the issues are any different now than they were five years ago. The only difference is that we understand the issues better. It's all a matter of cost per byte of memory, that's all it is.

What effect will the PS/2 have on the overall microcomputer market?
Architecturally, it's going to be an evolution rather than a revolution. The real pluses of the Personal System will be more evident when the new operating system is available. The architecture looks good, and their bus structure will be a standard in a couple of years.

Corvus head Siehl resigns

BY PATRICIA KEEFE
CW STAFF

SAN JOSE, Calif. — Loss-plagued Corvus Systems, Inc. recently announced the resignation of Chairman and Chief Executive Officer James L. Siehl from both the company and its board of directors.

Siehl, 53, who is leaving for personal reasons, will serve as a consultant to management. Siehl's wife was recently involved in an auto accident in which two passengers were killed and she was seriously injured.

No successor has been named, although Lewis T. Lipton, Corvus's president and chief operating officer, will assume the duties of acting CEO.

Siehl is credited with sparking what appears to be a turnaround for Corvus, according to Tom White, president of The Seybold Group's Consulting Services Group in San Jose. "Jim had turned the company around, finally. It was at a real low point a while back, but it's profitable again, and morale is real good," White said.

Siehl is credited with cutting costs and restructuring the embattled network concern, which has thus far weathered layoffs, almost two years of losing quarters and squabbles with a major investor.

White expressed optimism regarding a recent licensing arrangement between Corvus and Bell Canada Enterprises, Inc., giving the latter rights to Corvus's PC-NOS network software and some hardware.

"They had been looking for some time to have someone come and assist with the development of that technology, sharing in the risk and the fruits," White said. "[PC-NOS] is an interesting product that needs some work to bring it into the user world, to take it beyond [Corvus's] Omninet, where it can run like [Novell, Inc.'s] Netware."

PC-NOS does not require a file server but will support file-server operation. It reportedly features full network resource sharing, low installation cost and 100 levels of network security for appropriate network management.

The NEW SmarTerm® Family of Terminal Emulators

NEW! SmarTerm 240 version 2.0
Now with precise full-screen DEC VT241* four color display of ReGIS* graphics pictures. In addition, DEC VT240 and Tektronix* 4010/4014 graphics terminal emulation, and DEC VT220, VT102, VT100, and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

NEW! SmarTerm 2392
SmarTerm 2392 emulates the popular Hewlett-Packard HP2392* text terminal. Use SmarTerm 2392 to access your HP3000 host or Personal Productivity Center*. Supports ANSI, EM52, and TTY modes. Includes text and binary file transfer with Kermit and Xmodem error-free file transfer protocols.

NEW! SmartMOVE*
Combines power, ease of use, error-free file transfer and VT100/102 emulation in one "smart" communications software buy!

SmarTerm 220
DEC VT220, VT102, VT100, and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

SmarTerm 4014
Tektronix 4014/4012/4010 and RetroGraphics* VT640 graphics terminal emulation, with DEC VT102, VT100 and VT52 text terminal emulation. Includes TTY mode, and text and binary file transfer.

SmarTerm 400
Data General Dasher* D410, D400, D211, D210, D200, and D100 terminal emulation. Includes TTY mode, and text and binary file transfer.

All SmarTerm products are available through a dealer near you. For more information about our new family of terminal emulation and communications software, respond to the reader service number listed below. Or contact:

PERSOFT, INC. - 465 SCIENCE DR. - MADISON, WISCONSIN 53711 USA
(608) 273-6000 - TELEX 759491 - FAX (608) 273-8227

persoft®

ANNIVERSARY SALE GOING ON NOW.

NYNEX PROUDLY ANNOUNCES ANOTHER NATIONWIDE INDUSTRY FIRST: WE TAKE TRADE-INS.

We'll pick up your old equipment—Xerox® and IBM® typewriters, IBM, Apple®, or COMPAQ® PC systems—and we'll give you a credit* toward the purchase of the most up-to-date equipment on the market.

If ever there was a time for "out with the old, in with the new," this is it. Your NYNEX Business Center is giving you a chance to trade in the past for the future. No other national chain is.

As part of a national chain of nearly 100 business centers, we carry only the best equipment from the leading manufacturers.

We carry Apple, IBM, COMPAQ, and more.

THE ANSWER IS NYNEX
For the NYNEX Business Center nearest you call toll free:
1-800-346-9999 Ext. 171

What's more, we back up all this new technology with expert service. Our people have tailored integrated business information systems for companies large and small.

NYNEX Business Centers

IBM Authorized Dealer Advanced Products

THE INFORMATION CHAIN℠

Complete and mail to: NYNEX Service Center, P.O. Box 92831, Rochester, NY 14692.
☐ Send me a free brochure on how NYNEX Business Centers can help my business.
Name __________ Title __________
Company __________
Address __________
City __________ State __________ Zip __________
Telephone __________
Type of Business __________ No. of Employees __________
DCW5

*For up to 50% off the total new sale price on typewriters, and Apple, COMPAQ and IBM PCs. IBM is a registered trademark of IBM Corporation. Apple is a registered trademark of Apple Corporation. COMPAQ is a registered trademark of COMPAQ Corporation. Xerox is a registered trademark of Xerox Corporation. NYNEX is a mark of NYNEX Corporation. © 1987 NYNEX Business Information Systems Co.

NICKELS & DIMES

Sterling Software, Inc. announced revenue for the second quarter ended March 31 of $46 million, compared with $58.9 million in the previous year. Profits were $1.2 million, or 13 cents per share, compared with $1.4 million, or 17 cents per share, in the year-earlier period.

Autodesk, Inc. announced revenue for the first quarter ended April 30 of $17.3 million, compared with $11 million last year. Profits were $3.9 million, or 18 cents per share, compared with $2.4 million, or 12 cents per share, in the like period a year ago.

MAI Basic Four, Inc. reported revenue for the second quarter ended March 31 of $78.1 million, compared with $70.8 million last year. Profits were $5.4 million, or 36 cents per share, compared with $4.1 million, or 28 cents per share, in the comparable period a year ago.

Concurrent Computer Corp. reported net income for the third quarter ended April 30 of $2.4 million, or 21 cents per share, compared with a net loss of $700,000, or 6 cents per share, a year ago. Revenue was $64.1 million, compared with $56.9 million the previous year.

General Automation, Inc. announced revenue for the third quarter ended March 31 of $10.8 million, compared with $8.1 million in the previous year. Net loss was $5,000, compared with $3.3 million in the comparable period a year ago.

Dataproducts Corp. announced revenue of $338.8 million and net income of $9 million, or 43 cents per share, for the year ended March 28. This compares with revenue of $353.8 million and a net loss of $26.8 million, or $1.29 per share, in the previous year.

System Industries, Inc. announced revenue for the third quarter ended April 26 of $29.8 million, compared with $26.7 million last year. Profits were $1.4 million, or 25 cents per share, compared with $1 million, or 21 cents per share, in the comparable quarter last year.

Communications Corporation of America announced revenue for the quarter ended March 31 of $5.6 million, compared with $10.6 million the previous year. Net income was $3.1 million, or 57 cents per share, compared with a net loss of $1.3 million, or 25 cents per share, in the like period last year.

Encore Computer Corp. announced revenue for the second quarter ended April 25 of $3.5 million, compared with $650,000 for the same period last year. Net loss was $1.7 million, or 8 cents per share, compared with $2.7 million, or 12 cents per share, the previous year.

Xebec Corp. reported revenue for the second quarter ended April 3 of $22.6 million, compared with $23.9 million a year ago. Net loss was $2.1 million, or 16 cents per share, compared with a loss of $1.9 million, or 14 cents per share, a year ago.

Emulex Corp. announced revenue for the third quarter ended March 29 of $25.8 million, compared with $27.2 million the previous year. Profits were $1.3 million, or 10 cents per share, compared with $2.2 million, or 16 cents per share, in the like quarter a year ago.

Valid Logic Systems, Inc. announced revenue for the first quarter ended March 29 of $11 million, compared with $14.3 million last year. Net loss was $18.9 million, or $1.39 per share, compared with a net income of $147,000, or 1 cent per share, in the previous year.

The Ultimate Corp. announced revenue for the fourth quarter ended April 30 of $51.1 million, compared with $41.2 million last year. Profits were $4.4 million, or 45 cents per share, compared with $4.5 million, or 53 cents per share, in the like quarter a year ago. Revenue for the year was $172.9 million, compared with $139.9 million the previous year. Profits were $13.8 million, or $1.43 per share, compared with $14.5 million, or $1.70 per share, the previous year.

Symbolics, Inc. announced revenue for the third quarter ended March 29 of $24.6 million, compared with $30.9 million in the previous year. The company reported a net loss of $2 million, or 8 cents per share, compared with a net income of $3.5 million, or 13 cents per share, in the prior year.

EMC Corp. announced earnings of $5.7 million, or 36 cents per share, on revenue of $24.1 million for the quarter ended March 31. This compares with earnings of $4.4 million, or 32 cents per share, on revenue of $14.8 million reported in the like period a year ago.

Network Equipment Technologies, Inc. reported revenue for the year ended March 31 of $47.7 million, a 448% increase over the $8.7 million reported in the prior year. Net income was $5.1 million, or 41 cents per share, compared with a net loss of $6.2 million, or 67 cents per share, in the same period last year.

For the fourth quarter, revenue was $15.7 million, a 245% increase over the $4.5 million reported the previous year.

You get the greatest penetration of worldwide computer markets with *CW International Marketing Services.*

CW International Marketing Services connects you to CW Communications' global network of more than 70 computer-related publications in over 25 countries. And it's your one-stop service for international media buying. In fact, CW International Marketing Services is the only service that allows you to reach foreign computer professionals in MIS, communications, third-party and micro markets—all through one U.S. publisher.

No other publishing company offers you greater penetration of computer markets in more countries than CW Communications. And each of our newspapers and magazines is published and managed locally—and is written in its country's native language. This enables us to publish timely, accurate and credible editorial products.

Call today for more information and a CW International Marketing Services media kit. You'll reach computer professionals in more computer markets, in more countries—in less time—than ever before.

East Coast Sales Office
375 Cochituate Road
Framingham, MA 01701-9171
800-343-6474 (In MA, 617-879-0700)

West Coast Sales Office
3350 West Bayshore Road, Suite 201
Palo Alto, CA 94303
415-424-8844

CW COMMUNICATIONS/INC.
An International Data Group company

One reason our workstations stand alone

If Apollo workstations were judged on nothing more than their desktop computing abilities, there would still be numerous reasons to buy them. For they boast 32-bit processors, high resolution graphics, and the ability to run over 1200 application programs, including those developed for IBM PCs.

But these already compelling reasons multiply at an extraordinary rate when you understand that Apollo's DOMAIN networking capabilities are as advanced as our workstations.

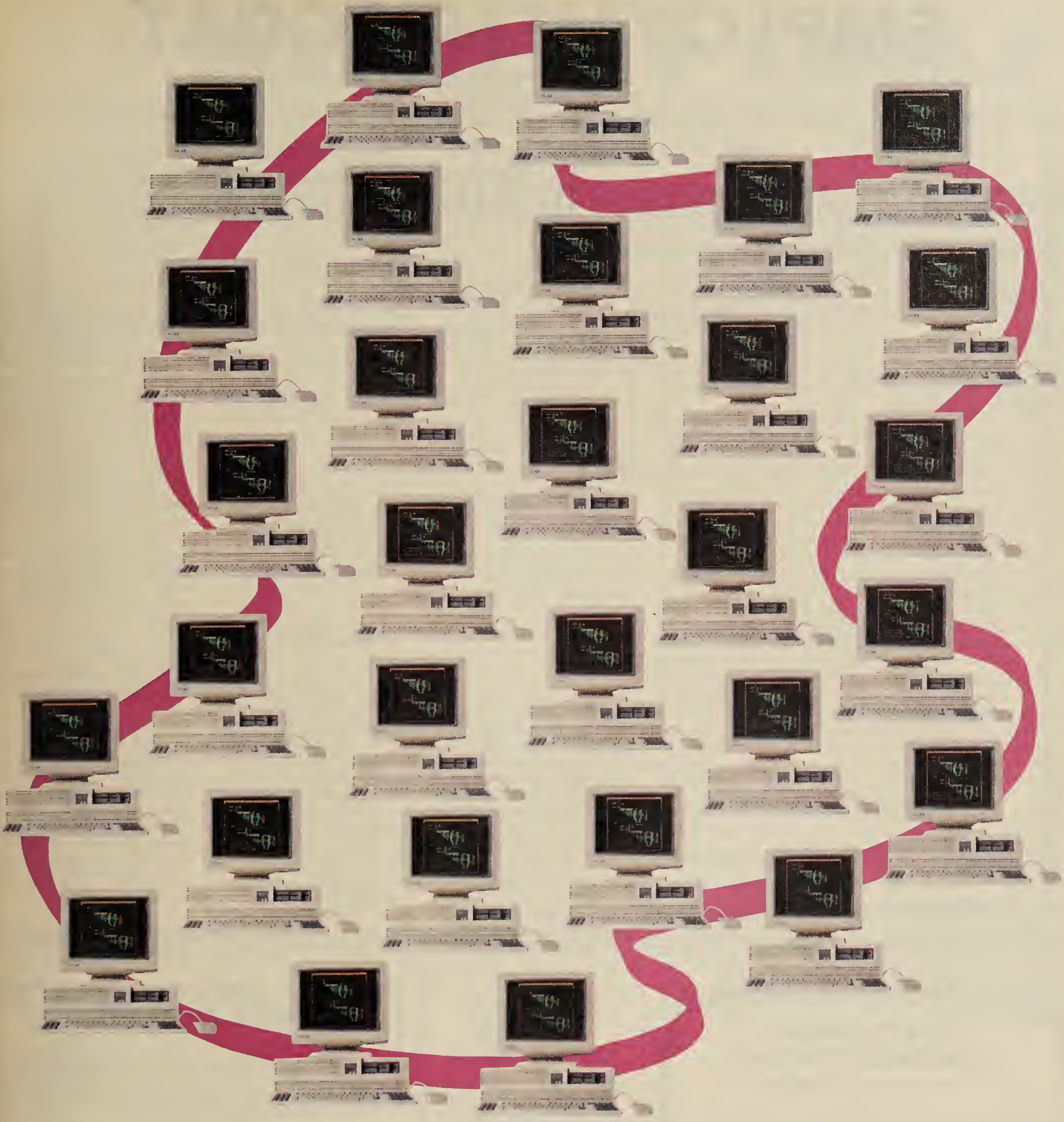
With an Apollo network you can connect not 10, not 20, not 100 workstations. But thousands of them. You can add or move them from one location to another with little more effort than plugging in a lamp and still have their files instantly recognized by the network. You can even protect the integrity of your data with file locking and security safeguards that control simultaneous access of information across the entire network.

Our system administration makes it as easy to manage a 1000-workstation network as a 10-workstation network. Letting you determine user access, structure a large network in smaller working units, and make changes quickly from any workstation on the network.

And no matter how many workstations or compute servers you incorporate into a DOMAIN network, the performance of the network never deteriorates. In fact it gets better for each user.

Because in addition to all the benefits Apollo has always

Apollo and DOMAIN are registered trademarks of Apollo Computer Inc. IBM is a registered trademark of International Business Machines Corporation. UNIX is a registered trademark of AT&T. ETHERNET is a registered trademark of Xerox Corporation. NFS is a trademark of Sun Microsystems Inc.



is that they don't.

offered – transparent access across the network, compliance with industry standards including both UNIX® System V and Berkeley 4.2, and easy access to other systems' data and files via Ethernet, SNA, NFS,™ TCP/IP and X.25 – an Apollo network can now deliver the first stages of network computing.

This is the ability to automatically apply the compute resources of a network simultaneously to a single problem. Inherently knowing when to send the power of a mini-super to a compute-intensive application, how to dispatch the acumen of a symbolic processor to wherever artificial intelligence is required, or when to call on the processing capabilities of a computer not in use.

All of which make Apollo workstations the best workstations you can buy for applications as demanding as mechanical modeling, electronic circuit design and mapping systems.

Apollo workstations, networking, application programs and standards. How we put it together is what separates us from everyone else.

Call or write Apollo at 330 Billerica Rd., Chelmsford, MA 01824, MS 30, (617) 256-6600 x4889. In Canada call (416) 297-0700.

apollo

The difference is Domain.®

Searching for happiness in MIS

DP professionals describe their best of all possible work worlds

BY JOHN EDWARDS
SPECIAL TO CW

Looking for the perfect MIS job is a lot like searching for happiness: The goal is elusive, and you do not always know when you have reached your final destination.

But MIS workers, a restless lot, continue to hunt for the ideal job. They scan the classifieds and forward resumes in a seemingly never-ending quest that they hope will ultimately lead to personal fulfillment and financial security. When asked, most have no trouble explaining their conception of the perfect job.

"The perfect job would never become mundane and would always have some type of challenge that would make the day pass quickly and painlessly," says Brenda Gonzalez, a programmer with the New York state Department of Motor Vehicles.

Gonzalez, a 35-year-old mother of three who has held five previous MIS positions, says her current job is not perfect but that it presents enough challenges to keep her happy. "It isn't the most glamorous job in the world, but there's enough going on here to keep things interesting," she says.

Jim Edwards, a data processing manager with Saunders and Pierce, a Middle Village, N.Y.-based publishing house, describes the perfect job as one that "pays lots and lots of money."

He says, "Let's face it, MIS isn't the most exciting profession in the world. It doesn't really matter if you work for a small publisher or a sports car manufacturer or a big movie studio — it's basically the same job. As far as I'm concerned, all that matters is money. If they pay you well, they'll have enough respect for you to treat you well, too."

Tim Bird, a local-area network (LAN) administrator for Cromtek Industries, a Philadelphia-based packaging products manufacturer, says that the perfect job is an unobtainable goal. "There is no such thing as the perfect job — in MIS or any other field," he says. "By its very definition, a job is something you have to do, not something you want to do. There are good jobs and bad jobs. The idea, obviously, is to get yourself a good job."

'A degree of stability'

Bird has some ideas on what constitutes a good MIS position. "In my field, a good job is something with a degree of stability," he says. Bird notes that the recent LAN explosion has made his work "a mixture of confusion and angst."

"I think I would be in heaven if I could administer a LAN that wasn't growing like topsy. To have a LAN that only has to be maintained instead of expanded would make my job a lot more pleasant," he says.

> "THERE is no such thing as the perfect job — in MIS or any other field. By its very definition, a job is something you have to do, not something you want to do. There are good jobs and bad jobs. The idea, obviously, is to get yourself a good job."
>
> TIM BIRD
> CROMTEK INDUSTRIES

Bird notes that administering a LAN with happy users would also make his job easier. "With LAN expansion, you get occasional system failures and the inevitable grumpy users," he says. "If I could find an all-around good job, it would be one in which I could satisfy all of the users all the time. When you're building a LAN, however, that isn't always possible."

Gonzalez says that employer demands can make an MIS job more difficult than necessary. "My current supervisor is fine," she says with a smile, "but in previous jobs, I have had some real dogs."

The perfect boss

According to Gonzalez, the perfect boss would be "understanding, sympathetic, helpful and would never give you a last-minute project that has to be completed in 48 hours or else." She notes, "A perfect boss wouldn't necessarily make for the perfect job; you would still have to have a challenging work environment and good pay. It would be a very nice bonus, however."

But DP manager Edwards notes that being a boss is not exactly the dream job some lower echelon employees believe it to be. "DP managers have their problems, too," he says. "Workers tend to think that managers have the perfect job, but they have pressures like any other employee. I don't know who's got it tougher, the manager or the workers. The manager often has to drive his workers hard because he's under pressure from his superiors. Of course, the manager gets paid more money, so that helps to make the job more bearable."

Any job at all

On the other hand, for some MIS employment seekers, the perfect job is any job at all. "Right now, I'd settle for just about anything in the DP field," says David Swirsky, a student at Queens College in New York. "For the newcomer with no previous DP experience, the market is pretty tight."

Swirsky, who is completing a four-year DP degree program, explains that even a fairly modest position, like a junior programmer, would be a step up from his previous job. "I used to deliver pizza for a take-out service," he says. "I did it for two years, so I would have some pocket money. After a while, though, it just got to be too tough to balance pizzas and a full course load, so I quit. Now I'm devoting all of my time to looking for a job."

Swirsky says he does not believe DP will lead him to fame or riches but that he is confident he has selected a career path with a solid future. "My father is a sanitation man," he says, "so I guess compared to that, anything in DP would be a dream job. I'm not too picky. I do look forward to working my way up the ladder, however."

Edwards is a free-lance writer based in Glendale, N.Y.

Vice President Information Systems
Multi-Hospital System

Position:
Responsible for all computer-based information systems and services. IBM focused, including stand alone; in-house mini, mainframe and network information systems; and time shared processes.

Candidate:
A seasoned executive with not less than 10 years of data processing information systems work, of which at least the last 5 have been in a hospital system having more than 350 beds. Demonstrated ability to develop, plan, manage and complete projects is required, with communication skills matching. Bachelor's degree required, Master's or advanced degree in Engineering, Computer Science, Math or Business Preparation will be advantageous.

Hospital:
We are a two-hospital acute care system with ancillary activities in medical and related services. We are not rebuilding or turning around, rather continuing a 25 year record of service to a medically sophisticated community. Information about our System can be provided, and our reputation may be verified through your medical sources.

Contact David G. Gyongyos, Director, Human Resources, Scottsdale Memorial Health Systems, Inc., 7220 E. Osborn Rd., Scottsdale, AZ 85251. EOE.

SCOTTSDALE MEMORIAL
HEALTH SYSTEMS, INC.

INFORMATION SERVICES ADMINISTRATOR

Provide administrative and technical supervision of computer and telecommunications systems. Develop, implement and update long and short-range automation plans. Successful candidates should possess a Bachelor's degree in Information Systems, Computer Science, or related area and five years of progressively responsible experience in programming and telecommunications, three of which are in a supervisory capacity or any equivalent. Master's degree in Computer or Information Science preferred. The capital city, Raleigh is located in the heart of Wake County offering historic, cultural and educational resources. Nearby Research Triangle Park provides an atmosphere of productive scientific research and development. Wake County offers a temperate climate and relaxed suburban lifestyle.

Competitive salary and benefits package. Forward resume, salary history and requirements by June 15, 1987 to:

Wake County Personnel,
P. O. Box 550,
Raleigh, NC 27602,
(919) 755-6482.
EOE/AA.

TEXT ANALYST

Charlottesville based law publishing subsidiary of Macmillan, Inc., is currently expanding its D/P staff. The following opening is available on a team developing an electronic publishing system involving sophisticated database operations and an elaborate distributed processing network.

This position requires broad hands-on experience with a large scale IBM mainframe system running MVS, a background in text database systems, PL/1 and CICS. Also highly desirable is experience with 'C', IBM PC's and photocomposition systems. The successful applicant will have project management skills including experience with large DP projects ($2M+).

Qualified individuals should possess a Bachelor's Degree or equivalent.

As a subsidiary of Macmillan, Inc., we offer competitive salaries, an excellent fringe benefits package and a high quality of life living area.

Principles only reply with resume *including salary requirements* (only inquiries with salary information will receive responses) to:

Reginald B. Ryals
Director of Administration
The Michie Company
Post Office Box 7587
Charlottesville, VA 22901

EOE M/F

ROBERT HALF

EDP OPPORTUNITIES COAST TO COAST

Robert Half, staffed by EDP professionals for EDP professionals with 100 offices throughout the U.S., Canada & Great Britain, is the largest network of personnel consultants in the Data Processing field. And its establishment in 1948 also makes Robert Half the oldest. One call and you can search the local, national and international markets. **All fees are paid by client companies, of course.** The following is a partial listing of opportunities and locations:

HARTFORD

PROGRAMMER/ANALYST

Hartford area oppty's for P/A's & S/A's w/CICS & IMS or IDMS exp. 2+ yrs exp req'd for an oppty to work in state-of-the-art environ. Our client will provide data base training for qualified candidates w/min 2 yrs COBOL. Excellent oppty for indiv's seeking growth & advancement. Paid reloc. Salary to **$37,000**

PROJECT LEADER

Solid bkgrd in developing investment/brokerage sys qualifies for local oppty's to direct new installation. Lg scale IBM-IMS bkgrd pref'd.
Salary **$40-50,000**

IDMS

3+ yrs COBOL/IDMS with fin'l, ins, or mfg bkgd qualifies for oppty's with clients throughout New Eng. Salaries to **$35,000**

PROJECT LEADER

Fortune 50 co seeks Proj Leaders work on CICS/IDMS env on devel + install of MFG sys. Purch, A/P + fin'l sys & package implementation skills a plus. Suburban loc. Excellent growth + paid reloc.
Salary **$42-47,000**

ROBERT HALF
of Hartford
111 Pearl Street
Hartford, CT 06103
(203) 278-7170

PROVIDENCE

PROJECT LEADER

Join a firm with outstanding growth record. Industry leader in financial services seeks seasoned project leader to play key role in Tandem; Basic; COBOL department. Enjoy coastal lifestyle of RI w/full benefits & reloc. Salary to **$45,000**

ROBERT HALF
of Providence
900 Turks Head Building
Providence, RI 02903
(401) 274-8700

CAROLINAS

SR PROGRAMMER ANALYST

NC Piedmont mfgr needs Sr PA with strong mfging bkgrd and COBOL/DL-1. Exp with COPICS, CICS and DOS would assure consideration. To **$40,000**

PROGRAMMERS & PROJ LDR

Multiple positions with major SC co. Progs & PL must have 3+ yrs exp in bus dev in multi-vendor on-line env. IBM/DEC main frame with COBOL & DBMS. Superior interpersonal skills.
To **$45,000**

DATA ADMINISTRATOR

6+ yrs exp with top-down structuring, bus modeling, bottom-up apps, techniques & procedures for "How to manage data as resource." To **$60,000**

Dorothea Sams
ROBERT HALF
of Charlotte
1395 Charlotte Plaza
Charlotte, NC 28244
(704) 339-0550

ST. LOUIS

PROGRAMMER ANALYSTS!

Many challenging opportunities are available in St. Louis' finest MVS shops. If you have at least 18 months experience in an OS/MVS shop using COBOL, you may have the best career move awaiting you in St. Louis. The systems you may work on include: Accounting, Payroll, Personnel, Manufacturing, Distribution, Sales, and packaged software too. All these positions offer very competitive benefits and opportunity for growth.
Salaries range to **$37,000**

MIS MANAGER-HP3000

Division of Fortune 500 manufacturer is looking for a Manager of their MIS department. Will manage a staff of 6-8 people in a HP3000/IMAGE environment. This is a great opportunity for you to dig in and be a Manager. Your technical background must be solid, and you should have experience with Micros, but most importantly you will be expected to manage with almost complete autonomy. Fabulous opportunity to be recognized for your accomplishments. Great relocation assistance and benefits. Salary to **$50,000**

TELECOMMUNICATIONS MANAGER

Diversified service organization is looking for a Telecommunications Manager to direct the efforts of Project Managers and their staffs in the areas of VOICE, DATA, LAN, and SATELLITE technology. Must have at least 5 years experience in these areas with demonstrated management/supervisory experience. BS Degree required, must also be able to communicate effectively to executive-level staff. This is an exciting shop with a very bright and ambitious future.
Salary to **$57,000** + perks.

ROBERT HALF
of St. Louis
7733 Forsyth Blvd.
St. Louis, MO 63105
(314) 727-1535

BOSTON

CICS P/A

Nat'ly recog corp seeks command lvl specialists for sys devel team. Environ is IBM 30XX, MVS/XA, IMS/CICS, COBOL & 4GL tools. This rapidly expanding firm desires fast-paced promotable pro! Salary to **$42,000**

WANG-VS ANALYST

Dynamic fin'l svcs org w/solid growth seeks tech astute analyst to lead new apps devel. If you have accomplishments in WANG-VS, COBOL & full cycle proj implem, contact us immed. Oppty to rise to middle mgt in near term. Salary to **$35,000**

SENIOR P/A - NH

Well-respected fin'l svcs firm in New Hampshire seeks proven P/A for on-line apps devel. Environ is IBM MVS/XA CICS COBOL DBMS. Oppty to do state-of-the-art work in the no-tax state. Salary to **$35,000**

ROBERT HALF
of Boston
100 Summer Street
Boston, MA 02110
(617) 423-1200

DAYTON

SENIOR MFG ANALYSTS

Use your MRP II experience to accelerate the attainment of your career goals. 2+ years experience in package implementation on NCR or IBM hardware is the key to your landing one of the many outstanding opportunities available. Call or write today. Fee Paid.
Salary **DOE**

ROBERT HALF
of Dayton
P.O. Box 756
Mid City Station
28 N. Wilkinson Street
Dayton, OH 45402
(513) 224-0600

MINNEAPOLIS ST. PAUL

MIS DIRECTOR

EXCLUSIVE! Do you have a professional depth to evolve an average DP shop to the state-of-the-art operations? This client's exec mgmt team is looking for a polished MIS pro to take charge of MIS and provide results. Requires excellent leadership skills, planning and project exp and mfg systems exp.
To Low **$50's**

SR S/A

EXCLUSIVE! Ready to take charge of your own shop? Blue chip client needs 2 top-notch S/38 pros to take charge of newly established divisional MIS functions. Requires 2+ yrs IBM S/38 and RPGIII and 1+ yr supervision. To Low **$40's**

Steve Casper or Beth Lund
ROBERT HALF
of Minnesota
3636 IDS Center
Minneapolis, MN 55402
(612) 339-9001

SOUTHERN CALIFORNIA

PROGRAMMER/ANALYST

Requires 5+ yrs banking or savings & loan experience w/MVS, CICS, IMS, DB, DL1 and COBOL. IBM 3080 Shop.
Salary **$40-45,000**

PROGRAMMER/ANALYST

2+ yrs S/38, RPGIII exper req'd. Mid-Wilshire local.
Salary to **$34,000**

ROBERT HALF
of L.A.
3600 Wilshire, #2000
Los Angeles, CA 90010
(213) 386-6805

FREE Ask for our latest Salary Survey.

ISC

Information Systems Consulting

ISC, Information Systems Consulting, a nationwide consulting/contract programming firm is expanding its staff of Permanent Contract Personnel. Positions listed below are for **long term** projects in Florida or Texas and offer excellent compensation, plus full benefits.

- **IMS/DB2–Manufacturing**
- **Model 204 – Oil & Gas**
- **VAX – Fortran – Oil & Gas/Engineering**
- **ADABAS/NATURAL – P/A's**
- **DATACOM, DBA**
- **HOGAN – all areas.**

For information, call (214) 490-1881, COLLECT, 8 a.m. to 6 p.m. CST, or send resume to:

ISC
340 Providence Towers East, L.B.8
5001 Spring Valley
Dallas, Texas 75244-3910 (214) 490-1881

TO ADVANCE YOUR CAREER—

Choose from 100s of top, new career openings—nationwide

Put our team of EDP placement specialists to work for you

We've assembled the nation's foremost EDP placement firms into a unique partnership called *computer net*. By sharing our resources, we're able to match your qualifications with hundreds of current client openings

Contact us today. Our client companies pay employment fees.

ATLANTA: Mau Inc
360 Bay St Suite 180
Augusta GA 30901 • (404) 722-6806

DURHAM, NC: VIP Personnel Inc
P O Box 2861
Durham, NC 27705-0861 • (919) 471-6404

HARTFORD: Vannah Rowe, Inc
11 Mountain Avenue
Bloomfield, CT 06002 • (203) 243-0424

L.A./ORANGE CO.: Computer Prof Unlimited
7411-D Garden Grove Blvd
Garden Grove, CA 92641 • (714) 891-1244

NEW YORK: Executive Directions Inc
2 Penn Plaza Suite 1185CW
New York NY 10121 • (212) 594-5775

POUGHKEEPSIE, NY: Ethan Allen Personnel
59 Academy Street
Poughkeepsie, NY 12601 • (914) 471-9703

npa computer/net
A PART OF THE FAMILY OF NPA NETWORKS

EXPERIENCED SYSTEMS PROGRAMMERS, ANALYSTS AND PROGRAMMER ANALYSTS FOR SUNBELT LOCATIONS

Job dissatisfaction complacency, and frustration are the biggest obstacles to overcome to achieve one's career goals Everyday new career opportunities pass us by because we are unaware of their existence Let us keep you abreast of what your true value is in the market place Absolutely no obligations, please call or write Keith Reichle, CPC. Data Processing Specialist

Dunhill
OF CHARLOTTE, INC.
6401 Carmel Road, Suite 107
Charlotte, North Carolina 28226
800-438-2012
(NC Call) (704) 542-0312

SYSTEMS ANALYST

The Data Processing department of Pierce County Medical Bureau, a Blue Shield Plan, is seeking a Systems Analyst. Responsibilities will include user requirements definition, system and program analysis, preparing design specifications and test plans, as well as directing program coding, testing and implementation. A successful candidate will have several years experience at a medium to large IBM site, project lead experience, excellent structured COBOL and system development skills, and strong written and oral communication skills. We are primarily a COBOL shop We use an IBM 4381, MVS/XA, TSO/ISPF, SNA and CICS. We use CINCOM's TIS, MANTIS, QUERY and Comprehensive Retrieval We offer competitive salaries, excellent fringe benefits and a pleasant working environment. Qualified applicants should submit resume in confidence to Personnel Manager, Pierce County Medical Bureau, Inc., 1114 Broadway Plaza, Tacoma, WA 98402. AACP/EOE

Burroughs Large Systems Technical Services Analysts

At Unisys San Diego, in Southern California, we're producers of semiconductor prototypes and integrated circuit designs for use in Unisys computer systems. We're new in name, and new in spirit. Combining the best of Sperry Corporation and Burroughs Corporation has made us a worldwide information systems leader with built-in prestige. Put your Burroughs large systems experience to work in one of these excellent opportunities:

Junior and Senior Level Positions

Technical Analysts are responsible for all system software implementation, support and enhancement in our large internal computer center with over 800 attached stations. Positions require a minimum of 1 year's Burroughs Large Systems experience in any of the following areas:

- MCP
- Datacom
- Compiler Internals
- DMS II Internals

We offer competitive salaries and benefits, provided in an environment of progressive professionalism. For immediate consideration, please send your resume to: **Professional Staffing, Unisys, Dept. CWHH, 10850 Via Frontera, San Diego, CA 92127.** Former Burroughs and Sperry employees are encouraged to apply. An Affirmative Action Employer M/F/H/V.

UNISYS

BUSINESS/SYSTEMS ANALYSTS

We Seek Hands-On Innovators For Complex Projects.

INTERGRAPH CORPORATION, a Fortune 500 leading-edge designer and manufacturer of interactive computer graphics systems, has immediate opportunities in our Huntsville, AL Corporate Data Processing Department.

All of the following positions require a four-year degree in Business, Computer Science or a related field and the qualifications indicated.

NETWORK COMMUNICATIONS

Requires 3 or more years hands-on experience with network communications, including ETHERNET, DECNET, X.25, PSI, and in-depth knowledge of VAX/VMS.

MANUFACTURING SYSTEMS

Requires 2-4 years experience with MRP-II, system design and implementation. COBOL knowledge is also necessary.

ORDER PROCESSING

Must be able to assume a key role in the design and implementation of an order processing system in a manufacturing/distribution environment. Relevant experience with complex, on-line order processing systems is required.

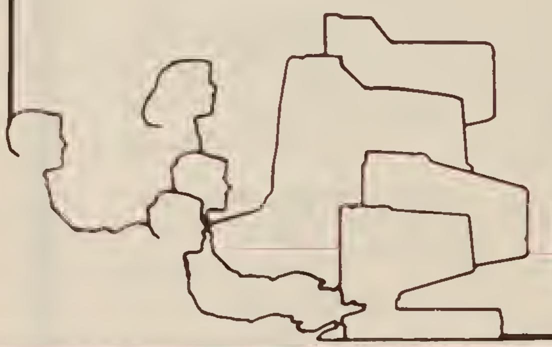
FINANCE/ACCOUNTING

Requires 1 or more years experience with automated financial systems in a corporate environment. Degree in Finance or Accounting required. CPA or MBA/Finance desirable.

INTERGRAPH offers attractive salaries, excellent benefits and growth opportunities. For confidential consideration, please send resume with salary requirements to:

Johnny Richards
INTERGRAPH CORPORATION
One Madison Industrial Park
Huntsville, AL 35807-4201.

An Equal Opportunity Employer, M/F/H/V.



INTERGRAPH

Contracts

Trident, a major force in European contract staffing, is making it big in America. We have urgent requirements for the following with two+ years' experience:

	CONTACT
HONEYWELL MAINFRAME BATCH COBOL GCOS 3 P/A — ***Penna***	**SM**
UNISYS (Sperry) DMS PIP COBOL P/A — ***Penna***	**SM**
UNISYS (Sperry) TELCON CMS or EXEC 8 SYST. PROG. — ***New York***	**SM**
UNISYS (Burroughs) LINC-LINC II P/A — ***Penna***	**SM**
UNISYS (Burroughs) LARGE SYSTEMS P/A — ***Penna***	**SM**
UNISYS (Burroughs) DATABASE ANALYSTS — ***Penna***	**SM**
UNISYS (Burroughs) BNS COMMUNICATIONS PROG. — ***Penna***	**SM**
UNISYS — MAPPER, WRITERS, DESIGNERS — ***Penna***	**SM**
HONEYWELL — SYSTEMS PROG. - GMAP, DUMPS — ***Mass/DC***	**SM**
HONEYWELL — LEVEL 6, "C", HONEYWELL PC — ***Mass***	**SM**
HONEYWELL — LEVEL 6, GCOS 6, IDS II, MOD 400 — ***DC***	**SM**
HONEYWELL/BULL, DMIV, IDS, TDS, COBOL — ***Mass***	**SM**
IBM — HOGAN, PROG. ANALYSTS — ***Mass/New York***	**LDC**
IBM — M&D SOFTWARE APPLICATIONS — ***Mass/Northeast***	**LDC**
TANDEM — TAL/GUARDIAN PROG. ANALYSTS — ***New York/Florida***	**LDC**
IBM — ADABASE/NATURAL P/A — ***Midwest***	**LDC**
IBM — IDMS/ADS-O, P/A — ***Mass/VA***	**LDC**
IBM — INQUIRE/TEXT, P/A — ***Mass/NH***	**LDC**
IBM — UCELL/SOFTWARE, P/A — ***Southwest***	**LDC**
IBM — OS/MVS, IMS DB-DC SYST. PROG. - Permanent — ***NY***	**LDC**
UNIX — "C" TELECOM or DATACOM S/W ENGR — ***New Jersey***	**LDC**

To apply, please send your resume to Trident Computer Services, 33 Boston Post Road, Marlborough, MA 01752 for the attention of the relevant contact above.

Or call (617) 460-0287.

TRIDENT
COMPUTER SERVICES INC.

Library: Head of Systems Department

Head, Systems Department, Price Gilbert Memorial Library of the Georgia Institute of Technology. Responsible for organization and coordination of all the Library's computing activities, such as the Online Information System which includes the Library's catalog and a number of other internally and externally-produced data bases; software library; CD-ROM projects; telecommunications networking; an active microcomputer program; and other systems supporting a wide range of Library functions. Activities often involve pilot and experimental projects. The Head of Systems supervises a staff of five, as well as directing the work of four programmers employed by an administrative programming unit.

QUALIFICATIONS:

Required: MLS from an ALA accredited school, or degree in computer or information science. At least three years in-depth experience in library automation, preferably in a large or medium-sized library. Management and/or supervisory experience. Experience with several library and/or large information dissemination systems, including at least one mini- or mainframe-based application; knowledge of microcomputing in a library environment. In-depth knowledge of new technologies and of currently available information transfer systems. Proven oral and written communications skills.

Desirable: Experience with: BRS Search/-software, implementation of integrated library system(s) on mainframe or microcomputer, telecommunications networks, interfacing between bibliographic utilities and local systems, and project management as related to systems department. Involvement in professional activities.

SALARY: $32,000 minimum

Applications will be accepted until position is filled. Preliminary screening will begin July 10.

An Affirmative Action, Equal Education and Employment Institution. The Georgia Institute of Technology is a unit of the University System of Georgia. Send application, resume, list of references to:

Elita Moyers
Administrative Coordinator
Price Gilbert Memorial Library
Georgia Institute of Technology
Atlanta GA 30332

1000 DP Opportunities

TANDEM/TAL Prog/Anal (2-5 yrs)	27-36K
TANDEM Sys Prog (3-7 yrs)	35-45K
VAX Prog/Anal (2-5 yrs COBOL, Mfg Apps)	28-36K
VAX Sys Prog (3-5 yrs VAX/VMS)	35-42K
VAX Soft Engr (2 yrs+ Elec Warfare/Aero)	30-40K
UNIX/C Soft Engr (2-5 yrs)	30-40K
IDMS-ADS/D Prog/Anal (2 yrs+)	27-35K
CICS Prog/Anal (2 yrs+ COBOL, MVS or DOS)	27-35K
IMS DB/DC Prog/Anal (2 yrs+)	28-36K
ADR/DATACOM-IDEAL Prog/Anal (2 yrs+)	26-33K
ADABAS/NATURAL Prog/Anal (2 yrs+)	28-36K
ASSEMBLER Prog/Anal (2 yrs+ IBM Assembler)	27-33K
S/38 Prog/Anal (2-5 yrs RPG III or COBOL)	27-33K
S/36 Prog/Anal (2 yrs+ MAPICS, RPG II)	26-32K
PRIME Prog/Anal (2 yrs+ INFO/BASIC or FORTRAN)	30-40K
HP 3000 Prog/Anal (2 yrs+ COBOL, Mfg apps)	27-32K
MSA Prog/Anal (2-5 yrs COBOL, IBM)	28-36K
Sys Prog (2 yrs+ MVS or VM or IMS or CICS)	30-45K
Data Base Anal (IMS or DB2 or ADABAS or IDMS)	40-55K
EDP Auditor (2-5 yrs EDP Audit)	28-42K

What do **you** want? A better **opportunity**, a more **challenging** position, a change in **geographical location**? We have the resources to assist you in **enhancing your career**. Largest employment agency in Charlotte, in business since 1975. 150 affiliates and 1000 client companies.

Rick Young, CPC (704) 366-1800
Corporate Personnel Consultants

3705 Latrobe Drive Suite 310
Charlotte, N C 28211

Information Services Project Manager - directs and coordinates activities concerned with development and marketing of interactive video information systems. Responsible for business planning and development of proposals for new information services projects. Initial project involves the design and implementation of a computer based public access information network. B.A. English, Journalism or Communications required. Must have 4 years experience working with interactive public access video systems, knowledge and experience of Telidon system software and NAPLPS software. Must have marketing experience in the field of information systems products. Job site: Santa Clara, CA. Interview: San Jose, CA. Salary: $40,000 per year. 40 hours per week. Please send your resume to Job Order No. MLU #4544, PO Box 9560, Sacramento, California 95823-0560 not later than 6/16/87.

Engineer, Development. To conduct research to develop state of art software not currently existing which can be ported to newer design computers. Develop hardware in Digital audio application and communication networking. Must possess Master's degree in Computer Science. Possess knowledge and experience with UNIX Berkeley 4.2 operating system, the C programming language, DEC/VAX Architecture and restructing and revision of current CAR/IRCAM music software. BA degree in music. $40,512/year. Job site and interview: Santa Barbara, CA. Send this ad and resume to Job AW5105, PO Box 9560, Sacramento, CA 95823-0560 not later than 6/17/87.

SYSTEMS ANALYST: Provide analysis, design, development, implementation, testing, documentation & training req'd to support a computer sys in an IBM 38 mainframe environment utilizing RPG III & CL. Meet w/users to determine sys & application req's. & develop interactive program utilizing structured design & development. Must utilize Screen Design Aid (SDA); Data File Utility; Query. Must have exp w/ & knowl of: System 38 (RPG III, CL); Screen Design Aid, Data File Utility; Query; Structed Design, Structured Analysis & Structured Programming. Applicant must possess Bachelor's degree (any field) & 3 yrs exp as Analyst/Programmer utilizing structured design; structured analysis & structured programming or 3 yrs in job offered. 35 hrs/wk, 9:30-5:30, $63,500/yr. Resumes to: Ref 102, Knight Programming Support, 800 3rd Ave, NY, NY 10022, Att: W Tompkins.

INVESTMENT BANKING, BROKERAGE, BANKING

NEW YORK/ NEW JERSEY

Benefit from the tremendous expansion of our clients' DP departments. Our clients include the leaders in investment and commercial banking, financial services, etc. Enjoy 4 wks vacation, bonuses, profit sharing, tuition refund. Call for more details on positions listed below. We guarantee you a thorough, professional career search in the NY metro area.

MAINFRAME

P/A's-Project leaders (hands on) w/2-10 years overall exp. including minimum 6 mos in any of the following: IMS/DB2/IDMS/CICS/-ADABAS. COBOL, BAL or PL/1. MVS/XA or DOS/VSE environments. Cross training avail. $33-55K.

Systems Prog's - All levels. Desperate need for any: MVS/XA, IDMS, IMS, DB2, CICS, DOS/VSE. $29-60K.

MINI/MICRO

VAX, STRATUS, TANDEM, IBM PC. Applications database, systems programmers w/-PASCAL, C, FORTRAN, COBOL or Assembler. ORACLE, INGRES. $35-65K.

COMMUNICATIONS

VTAM/NCP/SNA, Network design, data techs, market data, mini/micros. BSEE/-MSEE's. $30-60K.

MITCHELL/MARTIN INC.

80 Wall St, Suite 1215 (CW687)
New York, NY 10005
212-943-1404

In New Jersey
1515 Route 10, Suite 1000 (CW687)
Parsippany, NJ 07054
201-659-2888

SUN BELT Opportunity! MVS Systems Programmers

The University of North Carolina at Charlotte has two (2) positions for persons experienced in installing and maintaining a MVS operating system in a VM/MVS environment on an IBM 4381 networked to other vendor computer systems located on and off campus. Requires experience with CICS with experience with VTAM and/or quest MVS operating system desirable. Positions require 4-year degree and 4 years programming experience, including 1 year of systems programming, or a 4-year degree in Computer Science and 2 years experience.

UNCC is located in the growing metropolitan Charlotte area, centrally a four-hour drive from skiing and the mountains on the west, to the Atlantic beaches to the east. Offers outstanding climate with recreational activities available on nearby lakes, golf courses, theme park, motorsports, and various fine arts activities plus college basketball and concerts of all types.

Come and join us for an exciting and rewarding career. Please forward your resume' with salary history to:

The University of
North Carolina at Charlotte
Personnel Department
Charlotte, NC 28223 EOE.

Project Manager - Supervision and coordination of software development and system analysis in an on-line environment. Responsible for design concepts of entire system. Review new enhancements; upgrade and incorporate new developments in systems and software. Produce program specifications. Interface between users and project consultants. Estimate software resource requirements. Update status of projects. Work performed on Tandem nonstop II hardware in Guardian B-20 operating system environment. Required: Bachelors Degree with major in Science or Electrical Engineering and 1 year of experience in job offered. 35 hours per week. Salary: $40,000 per year. Job order # 8023828. D.O.T code 012167066. Mail resume to New York State Job Service, JO # 8023828, 247 West 54th Street, 4th Floor, New York, New York 10019

SENIOR RESEARCH ENGINEER

- Development of finite element programs for design and analyzing stresses, strain, vibration of automobiles, automobile chassis design, aircraft, nuclear power plants, and offshore structures. Salary, $28,000 per year, basic 40 hour week (8:30 am - 5:30 pm). Requirements: high school graduate; 5 years college with Master's Degree in Mechanical or Ocean Engineering; 3 hours course work in Digital Computer Methods; 3 hours course work in Computer Data Base Design, 3 hours course work in Information Structures; 2 years experience related occupation in Naval Design Architect. Send resume: MESC, 7310 Woodward Ave., Room 415 (Reference No. 27887) Detroit, MI 48202. Employer paid ad.

Software Representative - Consult with clients, managers of MIS, Data Processing Department and other top managements to analyze complex business transactions, procedures and data, determine users needs; select software and systems accordingly. Provide technical advice, liaise with clients. Demonstrate "POWERHOUSE" applications on HP3000, DG MV series, DEC VAX systems. Responsible for sales of CPU licenses, client services, consulting, education, documentation and maintenance contracts. BS/Computer Science 18 months experience or 18 months experience as Supervisor, Technical Services using POWERHOUSE 4GL, HP3000, DEC VAX and DG MV series. 40 hours per week. $40K per year. Apply: Georgia Department of Labor, 2972 South Cobb Dr., Smyrna, GA 30080 or nearest Georgia Job Service Center. Control #GA5221924

DATA PROCESSING PROFESSIONALS

Illinois Power Company, a progressive, medium-sized mid-western utility, has the following challenging opportunities. BS or BA in Computer Science, Computational Math, Business or a related field is preferred.

PROGRAMMERS, PROGRAMMER ANALYSTS, AND DATA BASE ANALYSTS

Requires 3-8 years experience in analysis or programming. COBOL necessary, with experience in CICS, IMS/DB, DB2, IBM's Data Dictionary, TSO/SPF, PANVALET, VSAM, IBM-Assembler, and structured design preferred. Identify needs, recommend software/hardware solutions, design programs and systems, oversee all phases of system development and implementation.

INFORMATION CENTER ANALYST

Minimum of 4 years experience in analysis and programming. Experience using MVS/XA, CICS, DB2/SQL, TSO/ISPF, PANVALET, VSAM, IBM PC's, LOTUS, SYMPHONY beneficial.

Work with end-users and Data Processing personnel to research, select and install new self-help computing tools. Select mainframe spreadsheet, use of DB2 for end-users, project planning and management, and implementation of office information systems, training and technical guidance of other analysts.

INFORMATION SYSTEMS EDUCATION SPECIALIST

Requires 4-6 years experience in an education function supporting Information Systems. Knowledge of programming and information centers required. In-depth knowledge of technology education techniques a must. Recommend and implement information system education programs for executive, professional, clerical, and data processing staff. Do cost/benefit analysis, make presentations and education evaluations.

CICS SYSTEMS PROGRAMMER

Requires 4 years experience in CICS system programming environment, BAL and COBOL, both Macro and Command programming, CICS internals, CICS exits, Debugging and performance tuning. Knowledge in DMS, ACF/VTAM, IMS/DB or TSO/SPF desired.

-ENVIRONMENT-

Our state-of-the-art environment features two large mainframes (3081 and 3090) with MVS/XA, JES2, CICS, ACF/VTAM, TSO/SPF, PANVALET, IMS/DB, DB2 and SAS, as well as multiple mini and micro computers and related software such as LOTUS, SYMPHONY, DISPLAYWRITE 3.

We are located 2 hours from St. Louis and 3 hours from Chicago in Central Illinois. Recreational facilities include parks, lakes, golf courses, health clubs, as well as cultural and educational opportunities. We offer excellent salaries and comprehensive fringe benefits.

For consideration, forward resume, including education, experience, personal and salary history, in confidence, to:

A.E. MARKUS

IP
ILLINOIS POWER COMPANY
500 South 27th Street
Decatur, Illinois 62525

An Equal Opportunity Employer M/F

System Developers
800-231-5920

Inviting resumes from individuals in the more highly technical computer related vocations such as: PHD Computer Scientists, Operating System Developers, Data Base Developers, Porting Specialists, Networks and Telecommunications, Architecture, Artificial Intelligence, Graphics Systems Developers, Microcoders and Firmware Developers, Compiler Development, etc. Special interest in emerging technology such as novel architecture, UNIX, ADA, etc. Similar interest in scientific applications developers including military, process control, data acquisition, telemetry and communications, CAD/CAM, simulation and modeling, etc.—we are a professional employment firm managed by graduate engineers. Fees are paid by the employer. All geographic locations. Send resume or call D. A. Redwine and ask for our free resume workbook & career planner.

Scientific Placement, Inc.
P.O Box 19949 CW
Houston, TX 77224
713/496-6100

UNIX is a trademark of Bell Labs

ADVISORY SYSTEMS ENGINEER - Plans, develops & writes programs within TPF (Transaction Processing Facility) environment using Assembler language & ACP/TPF, ACPDB software. Studies user needs & translates them into software programs; prepares high-level function specifications, logic & data flow analyses; designs, documents, codes, tests & debugs programs (using TPF test tools). Requires: BS or equivalent in CS, EE, DP or related; min. 7 yrs. programmer/analyst exp. in ACP/TPF environ.; extensive knowl. of IBM Assembler language & structured programming macros (SOF) for ACP/TPF; knowledge of VM/CMS, MVS and ACPDB, VPARS systems and operations thereof, demonstrated ability to use TPF test tools 40 hrs/wk.; $45K/year. Job and interview site: Concord, CA. Send this ad & resume to Job #TC-5176, P.O. Box 9560, Sacramento, CA 95823-0560 not later than June 15, 1987. EOE.

RESEARCH TRIANGLE OPPORTUNITIES

Currently recruiting experienced computer pros with background in any of the following: IBM Cobol: CICS: IDMS: IMS: Adabas: Oracle: DB2: SQL: ADR Datacom or Ideal: PL 1: VM CMS: Financial: Mfg.: Banking: Claims Processing: MRPII: MSA; MVS. NCP VTAM. ACP or CICS Systems Progrs: Capacity Planners: Best-1: Telecom Analysts: DB Analysts: Info Center Analysts: S 38 RPG III: DEC VAX Mfg. or scientific: DG: Melhod 1: Spectrum 2: SDM: Pride. Partial listing of local. regional & nat'l fee paid positions. Call or write.

The Underwood Group, Inc.
3924 Browning Pl.. Suite 7
Raleigh. NC 27609
(919) 782-3024

SOFTWARE PROFESSIONALS

Charlotte, North Carolina, Nashua, New Hampshire & Honolulu, Hawaii

All together now

The abililty to integrate all fuctions, to unite all users, to promote sharing and integration of information is key to success in today's computing marketplace.

Digital's ALL-IN-1* office automation and Electronic Publishing delivers on this promise of total office integration.

To guarantee this 'togetherness' technology continues its dramatic evolution, Digital has set up Application Engineering Centers in Charlotte, Nashua and Honolulu.

At these 'think tanks,' superior software minds have the opportunity to take on a wide spectrum of challanges as they spearhead our effort to extend the frontiers of knowledge in distributed processing technologies.

Join one of our elite teams and you will be involved in all aspects of product development for world markets. We want you to not only enhance the solutions we have in place—but to pioneer new applications that will take us to a new century.

Project Managers

Out of your 5-7 years experience in software systems/applications development or application service delivery, you've spent 2-3 years managing multi-people software projects. You must have a college degree, preferably in Computer Science, or the equivalent. Your technical competence and excellent verbal/written communication skills allow you to commmunicate with software engineers at a detailed level and with customers at a high level. Knowledge of an engineering develop-ment process is highly desirable.

Senior Business Application Developers

You'll need a college degree, or the equivalent, plus 5-7 years experience developing software business systems applications for finance and administration departments, retail and wholesale distribution, or marketing, sales and services, 2-3 years experience using VAX/VMS* and VAX-layered software, and 1-2 years experience developing ALL-IN-1 applications. Other desirable experience would include RDB, RALLY, VTX and experience in developing applications using PC-DOS or MS-DOS**.

Business Application Developers

After you received your college degree, or the equivalent, you have spent 3-5 years in developing software business systems applications for finance and administration departments, retail and wholesale distribution, or marketing, sales and services, as well as application service delivery. 2-3 years programming experience with VAX/VMS and VAX-layered software products such as DATATRIEVE*, DECgraph*, DECalc* and FMS* is highly desirable. And of course, application development using ALL-IN-1 is a strong plus.

Systems Engineers

Of your 4-7 years experience in developing software systems, at least 3 should include experience writing software using BLISS, MACRO, PASCAL or 'C'. Additionally, you should have 2-3 years experience programming on VAX/VMS systems. Knowledge of office or business systems, experience with PC-DOS or MS-DOS programming, and knowledge of either RDB, DBMS, DECnet* or DASL are also highly desirable qualifications. A college degree in Computer Science, or the equivalent, is required.

Technical Writers

In your 3-5 years of experience in writing both user and technical documentation for software systems, you've developed expertise in comprehending and communicating complex technical concepts. In addition to a college degree in English or Writing, or the equivalent, you should have a minimum of 1-2 years experience using computers—word processors, editors, text processors and the like.

If you are interested in helping design a fully integrated future, let's get together—now.

CALL 1-800-DEC-HIRE
24 hours a day,
7 days a week

If you can't call, send your resume to Z. Cleaven Royster, Area Employment Consultant, Dept. 0601 7804, Digital Equipment Corporation, 5775 Peachtree-Dunwoody Road, Suite 100-F, Atlanta, Georgia 30342.

We are an affirmative action employer.

* Trademarks of Digital Equipment Corporation
** Trademark of Microsoft Corporation

We are an affirmative action employer.

Digital and you . . . now.
Call 1-800-DEC-HIRE

digital™

CP&L: Where The Right Environments Come Together

Immediate Opportunities In Applications Development

Consider what you want from your career and then picture an ideal lifestyle. If you could have the right environment for both, your next career move would be an easy one. With CAROLINA POWER & LIGHT COMPANY, a major force in Southeastern power generation and distribution, the personal and professional environments come together to provide an excellent base for long-term satisfaction.

Let's examine our state-of-the-art technological environment first. Along with wide use of personal computers, we're operating two IBM 3090-200's, one IBM 3083J, one Amdahl 5860, and one Amdahl 5870. The CICS on-line environment has been growing at the rate of 75-100% per year. This year, we have expanded to a new Data Center. We're operating under MVS/XA and VM/CMS utilizing an SNA/SDLC network consisting of over 2,000 terminals and printers. Our programming languages are COBOL, DATACOM's IDEAL, SAS and Fortran. We have a growing Information Center environment and are aggressively pursuing end-user computing and office automation technologies.

Now, about personal lifestyle. With CP&L in the beautiful Carolinas, your leisure time can take place in the mountains or on the seashore—or in many great areas in between. Year-round, we enjoy a mild but seasonal climate and a wide variety of recreational and cultural events. The area has a moderate cost-of-living, excellent schools and fine housing.

We have recently completed a large strategic planning study and have a significant backlog of technical and application development projects. We are transitioning from a largely maintenance mode to an aggressive development mode. We are seeking talented individuals for the following:

APPLICATIONS DEVELOPMENT

- **Programmers**
  2-5 years structured coding experience in a development environment versus a maintenance environment. Highly desired experience would include: DATACOM; COBOL; IDEAL; CICS.
- **Systems Analysts**
  5-plus years experience in a development environment versus a maintenance environment. Highly desired experience would include: Structured analysis techniques; Relational Data Modeling; DATACOM/DB; On-line real-time systems; Arthur Andersen's Method/1; Prototyping; Application Generators.

CP&L offers competitive salaries, excellent benefits, and opportunities to advance. If interested in becoming part of our important team of professionals, send resume with salary requirements to: **Susie Brown, Recruitment Representative, Dept. CW6/1, CAROLINA POWER & LIGHT COMPANY, P.O. Box 1551, Raleigh, NC 27602.** An Equal Opportunity/Affirmative Action Employer.

CP&L

Carolina Power & Light Company
Energy In Operation

PERFORMANCE

REALIZE YOUR CREATIVE POTENTIAL

Long recognized as the industry leader in the development of the most advanced IBM system software performance monitoring products, such as Omegamon, Candle Corporation relies on the skills of our creative, highly-motivated software professionals to set the standards for others to follow.

We are now looking for more top performers to take us even further.

SOFTWARE DEVELOPERS

Will develop performance monitoring and system related software. Qualified candidates will have strong IBM Assembler or strong C programming skills. Experience with one or more of the following operating systems is required: IMS, DB2, MVS, VTAM, VM, CICS, DOS/VSE or UNIX*.

SYSTEMS ENGINEERS

Must have internals knowledge of CICS, MVS, or IMS. Experience in performance and tuning is a plus.

Candle's regard for people and recognition of performance takes many forms: Generous compensation and benefits including a 401(K) plan and Corporate Health Spa, a progressive and flexible environment, profit sharing and retirement.

Please send a resume, complete with salary history, or call:

CANDLE CORPORATION
Human Resources Dept. CW-PL 367
1999 Bundy Drive
Los Angeles, CA 90025
(213) 207-1400, ext. 2374

Equal Opportunity Employer M/F/V/H

*UNIX is a trademark of AT&T Bell Labs

!Candle

THE BEST

Our firm has 21 years experience delivering state-of-the-art projects to Fortune 500 firms throughout the USA. The following is a sample of our needs:

IMS	**Chicago & Indianapolis**
IDMS	**Chicago & Indianapolis**
DB2	**Chicago**
TANDEM	**Chicago/Indianapolis**
GCOS/8	**Phoenix**
8100/DPPX	**San Diego**
TRANSFORM	**Phoenix**

Additional Positions Available

Send resume indicating salary and location desired or call Manager Corporate Human Resources.

317/634-9482

INDECON, INC.
One American Square
Box 82058, Ste. 1325
Indianapolis, IN 46282

Relocation Assistance Available
Equal Opportunity Employer

SENIOR PROGRAMMING/ANALYST, Systems and Programming Dept. of the MIS Division: Design & implement computer systems relating to distribution & inventory systems as they apply to the record industry such as oper procedures, sales policies, distrib & return policies, budget & control procedures & Royalty & Copyright systems. Must have good understanding of sys methodology, performance monitory & tuning methods, data dictionary & the significance of each element as they apply to the company & the entertainment industry in obtaining company objectives. To perform functional req analysis, systems analysis/design & system implementation by utilizing the in-depth knowl of software ADABAS/NATURAL, CICS, PREDICT, TRIM performance monitoring, DOS/VSE & VOLLIE/LIBRARIAN. Must have Bachelor's degree in Computer Sci or equivalent. Equivalent = 2 yrs of exp as Programmer/Computer Operator. Must have 1 yr of exp or 1 yr exp as Programmer/Analyst. 40 hrs/wk, $41,000/yr. Mail resume to: NYS Job Service, JO#NY800617, 97-45 Queens Blvd, Rego Park, NY 11374, DOT Code 012.167.066.

SYSTEMS DEVELOPMENT MANAGER

Stable NC Manufacturer needs strong Mgr with business dev exp in mfging environment. Will interface with upper mgmt and supervise staff of six. 4381 with MVS, COBOL, CICS. To $46K

SYSTEMS PROGRAMMER

Rapidly expanding Peidmont co has urgent need for DOS/VSE with CICS SP. Will be resp for in-house sftwre dev and communicate to applications side. To $45K

WESTERN VIRGINIA

World headquarters for div of major corp opening Immediate need for Applications Mgr to $42K; VTAM SP to $38K; IDMS DBA to $40K. Env: DOS/VSE VM/CICS & IDMS. Ap Mgr must have MRP or MRP II. Excellent career oppty

Dorothea Sams

ROBERT HALF
of Charlotte
1395 Charlotte Plaza
Charlotte, NC 28244
® (704) 339-0550

Systems Programmer needed to analyze current procedures and problems to refine and convert data to programmable form, determining output requirements, study existing systems to evaluate effectiveness, upgrade systems presently in use; develop and implement new systems to meet current and projected needs, develop, write and implement new programs; observe functioning of newly implemented/upgraded systems and programs for trouble areas; and correct systems programs as necessary. Must also be capable of operating large scale computers such as IBM, Hewlett Packard, VAX and TANDEM, COBOL, FORTRAN, DL/1, C, UNIX, VSAM & DATATRIEVE. Must also be willing to work in Ontario, CA. B.A. in Comp Sci or equiv (equlv means B.S. in Math, Physics, Data Processing or Engineering) and 3 yrs exp. $33,000/yr. Send ad & resume to Box #CW-B4922, Computerworld, P.O. Box 9171, Framingham, MA 01701-9171

Computing: Director Of Colorado's SuperNET Computer Network

SuperNET is a joint creation of Colorado Advanced Technology Institute (CATI) and state's research universities Experience in networking for research activities, marketing, and administration required. The Director will: oversee operation and expansion of SuperNET; maintain and approve connections with regional, national, and international networks; manage the annual funding cycle and budget development for SuperNET, and maintain as well as initiate ties between SuperNET and corporations in Colorado. Director reports to the governance board. Salary: negotiable. Starting date: July 1, 1987 or as soon as possible thereafter. Send resume and references by June 15, 1987 to SuperNET, PO Box 10127, Denver, Colorado 80210

Programmer/Analyst

Utilizing knowledge of PDP-11, micro-data, VAX-11, RCS 325 & RCS 564 computers, subject will develop, enhance and support dealer communications systems software; analyze software requirements & problems, determine enhancement solutions; upgrade software using structural methodology, create & enhance new tools for programming development & applications of dealer communication systems, vehicle parts inventory systems of large auto manufacturer dealer network; code all applications. Requirements: Master's degree in Computer Science; at least 6 mos. work exp. in PDP-11 & assembler language; willing to work/relocate in Portland, Oregon area. Salary: $30,836/yr. 40 hrs./wk. Applicants send resume to: Employment Division, Attn: Job Order #1997764, 875 Union St., N.E. Room 201, Salem, Oregon 97311.

San Francisco CONSULTING OPPORTUNITIES

GW Consulting is currently recruiting D.P Professionals for subcontract positions in the San Francisco Bay Area. Specific requirements include:

- IDMS ADS-O
- TANDEM
- SEI TRUST
- AUTOMATED FINANCIAL SYSTEMS (Loan Systems)

Compensation package includes 401K and Profit Sharing.

Please call or send a resume for immediate consideration to:

GW Consulting
507 Howard St., 2nd Flr
San Francisco, CA 94105
(415) 896-5566
Attn: S. Collier

The best EDP people in the Bay Area pass through our doorway

You can be one of them; for nearly 15 years the best companies have relied on CRG to find superior data processing professionals to meet their needs. To find out what we can do for you, call today or mail your resume to: **Computer Resources Group, Inc., 303 Sacramento Street, San Francisco, CA 94111, (415) 398-3535, or 3080 Olcott Street, Suite 130A, Santa Clara, CA 95054, (408) 727-1658.**

The Computer Resources Group, Inc.

An Affiliate of
National Computer Associates

SYSTEMS ENGINEER

Design, implement, test and install database and data communications sub-systems for on-line hotel information systems. Will use IBM PC, IBM Series/1 and IBM mainframe Code BAL under VM/CMS and ACP/TPF operating systems; and Code C, 8086 assembly language on IBM PC. Code EDL on IBM Series/1. Experience to include IBM Index Access Method, Asynchronous, Binary Synchronous, Synchronous Data Link Control Communication protocols, multi-tasking, on-line transaction driven systems development, IBM Series/1 hardware, system generation, System installation and Event Driven Language under Event Driven Executive operating system. Knowledge of IBM CF-Communication facility and SNA. Master's or equivalent in Computer Science plus 6 months experience or Bachelor's in Computer Science plus 2 - 3 years expenence. $2,600.00/month. Site/Interview Hayward, California. Clip this ad and send with resume to Job Number MA4551; P.O. Box 9560, Sacramento, CA 95823-0560 not later than June 15, 1987.

COMPUTER SYSTEM ENGINEER

Responsible for analysis of data processing requirements for computer system consultants. Evaluate, test & modify application software to determine solution to data processing problems. BS in Electrical/Computer Engineering req'd. Must have strong background in hardware and software. $2,500/-mo. Job & interview in Pasadena, Calif. Send ad and resume to 232 N. Lake Ave., Suite 213, Pasadena, Ca 91101.

SYSTEM ANALYST. Plan and develop methods for computerizing general ledger, A/P, A/R, and inventory systems. Prepare charts/-diagrams for system users. Select hardware/software to set up systems. Requires B.S. in engineering/computer science or M.S. degree in lieu of experience. $2,800/-per month. Job site/interview: Los Angeles, CA. Send this ad and your resume to Job No. H04586, P.O. Box 9560, Sacramento, CA 95823-0560 not later than 6/15/87.

SYSTEMS PROGRAMMER/ANALYST: Design, modification & maint of systems architecture in an on-line SPERRY mainframe environment. Analyse & determine problems w/sys making nec reports or recommending solution. Plan for enhancements of sys i.e. meet w/users & determine needs. Design architecture to encompass future needs. This forecasting req's analysis of current sys bottleneck & sys performance. Will supervise systems programming & users in operating systems. Must have exp & knowl of COBOL, ASSEMBLER, SSG, DML, TIP (on-line); DB Forecasting & Logical/physical database design support & maint; SPERRY; Mainframe Internals Applicant must possess 10 yrs exp as Programmer/Analyst using SPERRY software w/emph on Database side of programming or 10 yrs in job offered. 37½ hrs/wk. 8:30-5pm, $55,500/yr. Resumes to: Ref 103, Knight Programming Support, 800 3rd Ave, NY, NY 10022, Att. W Tompkins.

ACP/TPF SYSTEMS PROFESSIONALS

Our client, one of the largest and most dynamic providers of management information consulting services in the world, has an immediate need for ACP/TPF systems professionals to staff expanding operations.

These professionals will work on prestigious and technically advanced projects.

Positions will offer challenge and the opportunity to demonstrate ability. Openings and requirements include:

FACILITY MANAGER
10 + years in TPF environment

LEAD SYSTEMS PROGRAMMER
7 + years providing TPF coverage

SYSTEMS PROGRAMMERS
2-5 years in one or more of: TPF, MVS/XA, VM, VTAM/NCP, network management.

COMPUTER OPERATIONS SUPERVISOR
5 + years in TPF environment

COMPUTER OPERATORS
1–3 + years, lead and junior positions in TPF computer operations

APPLICATION PROGRAMMER/ANALYSTS
1–3 years assembler programming in PARS/TPF environment

For consideration, send resume in confidence along with salary history to: Deutsch, Shea & Evans, Box 654, 485 Fifth Ave., New York, NY 10017. If you wish, please indicate the name of your current employer on the envelope and we will not forward your resume to that company. Our client is an equal opportunity employer.

DSE
Deutsch, Shea & Evans, Inc.
ADVERTISING

IBM SYSTEM/38 SPECIALIST

Midland Hospital Center, a progressive 307 bed subsidiary of Mid-Michigan Health Care Systems, is seeking a dynamic, self-motivated individual for the position of IBM System/38 Specialist. Primary responsibilities include capacity planning, performance monitoring and analysis, performance tuning, system software, and technical direction setting for the entire Mid-Michigan Health Care Systems Information Resources function. This rapidly growing health care systems environment currently includes an IBM S/38 Model 700, 2 IBM S/36, and 200 network attached microcomputers.

Qualified applicant should have the following: Bachelor's degree in Computer Science or related field, 3-5 years IBM S/38 and RPG III experience, proven communication, planning, and analytical skills, and experience with IBM S/36 and remote communications in a S/38 environment. Experience with a healthcare environment, Dynamic Control software, and microcomputers would be a definite plus. Interested applicants please send resume, salary requirements, and references to:

Susan H. Dirks
Employment Coordinator
Midland Hospital Center
4005 Orchard Drive
Midland, MI 48670

Equal Opportunity Employer

Associate Director Of Data Processing

Knox College is seeking applicants for an Associate Director Of Data Processing. This person will participate in the analysis, planning, design and implementation of systems supporting the administrative operations of the college and will assist in the direction and operation of the data processing department.

Qualifications:

- 3-5 years supervisory or managerial experience
- Minimum of Bachelors Degree
- Experience with the design and development of data base management systems
- Experience with Basic Plus and Fourth Generation Languages
- Knowledge of financial/administrative systems in an academic environment
- Knowledge of VAX/VMS
- Experience with telecommunications networks
- Good communication and interpersonal skills

Salary is competitive, with excellent fringe benefits. Preference will be given to early applicants. Send letter of application and resume to **Mr. Charles Gibbs, Director Of Data Processing, Knox College, Galesburg, Illinois 61401**

Knox College is an Equal Opportunity/
Affirmative Action Employer

PROGRAMMERS/ CONSULTANTS

2-year contract

All new development- East & West Coast locations

(3) IMS Development-conversion to DB2	$89,000
(4) UCCEL	Open
(4) HOGAN-UMBRELLA	$88,000
(6) M&D-MILLENIUM	$62,000
(4) GENESYS	$91,500
(5) DB2	$80,800

Other assignments available. IDMS/ADS & CICS/IMS.

Call Rick Wilson at **617-648-7559** for details or send resume to:

LENCO
Computer Consulting
661 Mass. Ave., Suite 25
Arlington, MA 02174

Mainframe and Microcomputer Business Application Developers

Preview TRW's New Age Technology By Calling (213) 535-6632 Collect.

Representatives of TRW's Operations and Support Group, Southern California, will soon be in the areas noted below. Take advantage of this opportunity to discover what New Age challenges, tools, and programs are available to you.

In the near future we'll be interviewing in these areas:

Boston
Dallas
Detroit
New York/New Jersey
Philadelphia
St. Louis
Washington, D.C.

If you're abreast of America's leaders in advanced technologies, you're already aware of TRW's innovative research and development programs such as Strategic Defense Initiative, Space Station, Milstar, Automated Message Processing Exchange and Space Telescope. Even more relevant to your expertise is the development of a number of state-of-the-art IDMS-based projects. ECATS (Employee Cash and Travel System) and DASARP (Data and Systems Architecture Redesign Project), are just two examples. Call to explore these career opportunities:

Technical Consultant

You'll team up with software developers in resolving application problems in IDMS, JCL, TSO, SPF, and utilities. You'll also be responsible for helping identify training requirements and may develop and help support training programs.

In order to qualify, we require strong IDMS skills, a minimum BS and 5 years of progressive experience supporting large mainframe IBM operating systems and database management systems. Experience in PCs, interactive development tools, fourth generation languages, data communications and project management will be to your advantage.

Sr. Integration and Test Analyst-IDMS

You'll plan and conduct migration, integration and test of sophisticated on-line IDMS financial and business management systems. Qualifications include a minimum BS and 2 years on-line IDMS integration, migration and test experience.

IDMS Database Administrator

You'll be involved in the design and implementation of IDMS application databases, which includes both physical and logical design, database performance, system migration, unload/reload, database restructure, and technical support for GLOBAL, DCMS and SYSGEN HELP. Finally, you'll provide support to the applications staff with coding and troubleshooting problems. To qualify, we require a minimum BS and 2 years DBA experience in a large mainframe IBM, IDMS environment.

IDMS Programmer/Analyst

Responsibilities for this opportunity include user interface, system design, ADS-O and COBOL coding, in a highly structured methodology environment. Programmer/Analysts workstations are IBM PC/AT-based, having the latest development tools. You'll be required to have a minimum BS and 2 years software development experience in a large mainframe IBM, IDMS/ADS-O environment.

IBM/PC Application Support Specialist

Your focus will be on internally developed project management software, providing product support and training, program design/implementation/testing and documentation. Knowledge of DOD procedures and C/SCSC will be to your advantage. Experience with dBASE III+, LOTUS 1-2-3 and PC programming is also desirable.

PC Programmer Analyst

You will be responsible for the design and development of user-friendly applications for the IBM PC and compatibles; along with the development of system libraries, which include device drivers, communication handlers, keyboard and screen handling routines. Qualifications include a minimum BS and 3 years experience using 'C' 8086 Assembler, PASCAL or comparable language in a large IBM micro-mainframe environment.

Micro-Mainframe Programmer Analyst

Areas of responsibility include the design and development of user-friendly interfaces between micro and mainframe applications using commercially available products; requirements gathering; evaluation of current communication technologies; and feasibility analysis. You will qualify with a minimum BS, 3 years development experience ('C,' PASCAL, ASSEMBLER or comparable languages) in a large IBM micro-mainframe environment, along with a working knowledge of LAN, micro-mainframe communications products and SNA.

If you have experience in any of the above disciplines, and are ready to preview technology for a new age, call us collect. TRW offers outstanding salaries and benefits. If you prefer, send your resume today to: **TRW O&SG, R. Chambers, P.O. Box 188, Manhattan Beach, CA 90266.**

Equal Opportunity Employer
U.S. Citizenship Required

TRW

MAINE - N.H.

We have specialized in data processing professional placement in Maine & N.H. for a fifth of a century. If you qualify for positions in the $25-50,000 range, please contact us in total confidence. Our clients pay our fees and provide relocation assistance.

ROMAC®

Att: Dept. 2
P.O. Box 7040 DTS
Portland, Maine 04112
(207) 773-4749

FLORIDA CONNECTION

ALL EXPENSES PAID

Our clients in urgent need of your expertise, will pay all your expenses in relocating you to an area of sun and fun. No state tax, average temperature 75°.

Software & Hardware Engineers
Programmers & Analysts
Systems Programmers & Capacity Planners
Database Administrators & Analysts

AVAILABILITY, INC.
813/872-2631
Dept. C, P.O. Box 25434
Tampa, Florida 33622
'Since 1969'

DATA PROCESSING BURROUGHS 4700 ADMINISTRATIVE MGR

$60,000

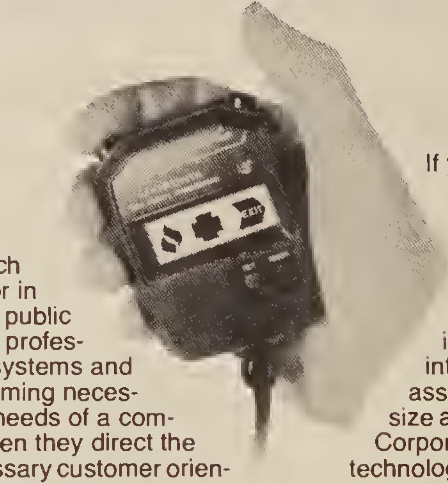
Wall street loc is only one of the many feathers in the cap of this large banking inst. Reporting to the CEO, this spot abounds with responsibility! Run the entire shop's operations, includg the B.4700, telecommunications & the administrative duties of 15 people.

ROBERT HALF
OF NEW YORK, Inc.
522 Fifth Avenue
New York, NY 10036
® 212-221-6500

Computer Professionals

Use your TANDEM or VAX experience to provide life cycle services for life-saving systems coast-to-coast and beyond.

Openings in San Francisco, Los Angeles, Chicago and Washington, D.C.



With minutes often making a difference between life and death, PRC's emergency vehicle dispatch system is a key factor in a growing number of public safety agencies. Our professionals perform the systems and applications programming necessary to adapt to the needs of a community or agency. Then they direct the installation and necessary customer orientation. Some travel is involved.

The flexibility of our system allows for considerable initiative and imagination on your part. Possibilities range from small systems providing message reception, vehicle selection and dispatch to highly complex systems providing detailed information on the emergency . . . for instance, on-screen floor plans of a burning building.

If you are comfortable with real time programming with MACRO-11 on VAX or TAL on TANDEM and have 2-4 years' experience in systems analysis and programming, we welcome your inquiry. You will work with small, informal teams on diversified assignments. An added plus is the size and scope of Planning Research Corporation, the international leader in technology-based professional services.

For immediate consideration, please send your résumé to: **Planning Research Corporation, Government Information Systems, 1500 Planning Research Drive, Dept. JA-57, McLean, Virginia 22102.** An Equal Opportunity Employer M/F/H/V.

prc

Planning Research Corporation
Government Information Systems

COMPUTER SYSTEMS PROFESSIONALS

As a division of the nation's largest search and placement organization, COMPUSEARCH gives you a network of contacts to every level of the D.P. industry Career opportunities include:

ADR DATACOM	**POWERHSE: FIN. APPL.**
MAPICS; RPG II	**LAN SALES**
HP 3000 COMM.	**TELECOM SALES**

WE FIND THE CHALLENGE.
AND THE CHALLENGERS.

CompuSearch®
A DIVISION OF MANAGEMENT RECRUITERS
OF LONG BEACH

4500 E. Pacific Coast Hwy., Ste. 350
Long Beach, CA 90804
(213) 597-0554

IMMEDIATE OPENINGS

PROGRAMMERS
PERMANENT
AND/OR CONSULTANTS
NEW YORK, NEW JERSEY
NEW ENGLAND

--IBM--

- Systems Prog'rs - MVS, IMS, DB/DC
- COBOL Prog'rs--all levels

--DEC--

- Proj Mgr-VAX, INGRES, C
- Prog'r- Analysts-VAX, INGRES, C

--HONEYWELL--

- Database Administrator, DMIV

Please call 212-684-3950
or submit resumes to:
HANK WALSH ASSOCIATES
475 Fifth Av., NY, NY 10017

IBM 38

Programmers, Programmer Analysts with 1 year plus experience – Let us update you on the rapidly changing IBM 38 market Nationwide. To confidentially explore exciting new career opportunities rush a resume or call Deanna Gear.

DUNHILL OF
ALBUQUERQUE, INC.

1717 Louisiana NE, Suite 218C
Albuquerque, NM 87110
(505) 262-1871
Exclusively Employer Retained

Systems Analyst

- Diagnose and optimize Electronic Mail and hardcopy host developed by employer system using PASCAL on a VAX-11/780 and VAX/-VMS operating system. Using parallel processing (clustering) to perform electronic mail and data processing. Develop software programs to improve the system performance and maintain system. Solve technical problems as they arrive. Independently install new system. Analyze hardware/software failure under all circumstances. Requires a Masters Degree in Electrical Engineering. No experience but graduate study should include a project in which the candidate used PASCAL on a VAX-11/780. Education should include one course in: Parallel Processing; Computer Network; and Operating System. Salary: $33,500 per year. 40 hours per week, 8am-5pm. Monday through Friday. Send resumes with abstract from project and evidence of necessary coursework to: Illinois Department Of Employment Security, 401 South State Street - 3 South, Chicago, Illinois 60605, Attn: Marie Ninneman. Reference # 7163-N. An employer paid ad.

SOFTWARE ENGINEER: Involves building a high speed Motorola 68020 based laser recorder controller which will run device control & communication software to process lge vol of digital medical image data. A network of Sun Microsystems 3 computers will be used as development machines. VRTX will be used for cross development. Programming lang "C" will be used for all software development. Duties incl: software architecture design; sys & application software programming; supervision of sys (hardware & software) integration. Must have knowl & exp in UNIX operating systems; "C" programming lang, Sun 3 computers; computer imaging, communications protocol, systems software programming. Must know Motorola 68000 microprocessor. Applicant must possess M.S. Computer Sci & 1 yr combined training & exp in research of computer/electronic imaging or BA computer sci & 2 yrs combined training & exp in research of computer/electronic imaging or 2 yrs in job offered. 40 hrs/wk; 8:30-5:00; $36,000/yr. Resumes to: JO# 0700564, Job Service, 55 Church St, White Plains, NY 10601, DOT Code 020-067-010.

Programmer/Analyst

Utilizing knowledge of advanced software engineering systems, database management systems and structure analysis, subject will analyze, design and develop applications software for transportation industry; test, maintain and support software; design, develop and maintain database; plan & prepare technical report & manual documenting applications software; analyze and resolve problem systems and enhance existing software products. Requirements: Master'-s degree in Math/Computer Science; at least 6 mos. work exp. in mini/macro computer & assembler language; willing to work/relocate in Portland, Oregon area. Salary: $30,836/yr. 40 hrs./wk. Applicants send resume to: Employment Division, Attn: Job Order #1997765, 875 Union St., N.E. Room 201, Salem, Oregon 97311.

Marketing

FIND
T·H·E
FUTURE

At **Digital Communications Associates (DCA)**, located in **Atlanta, GA**, the future can be found in exciting products for the data communications and private networks industries. Our IRMA™ microcomputer products are an industry standard and our sophisticated line of statistical multiplexors and T1 products is an industry leader. We have the following positions available in our **marketing** department.

PRODUCT MANAGER

Responsible for products in the IRMA™ family. Interface with engineering, product support, product marketing manager and manufacturing to turn ideas into products as well as manage and enhance existing products. Requires 3-5 years experience in hardware/software product management. Knowledge of 3270 data communications beneficial. Technical background and/or an M.B.A. desirable. Strategic planning and budgeting experience helpful.

PRODUCT MARKETING MANAGER

Responsible for products in the IRMA™ AND IRMAX™ family. Primary interface to DCA sales, training, advertising departments for given products. Develop marketing plans (pricing, promotion, distribution, advertising, training) for the introduction of new products, and develop plans to continue to enhance the success of current products. Position requires some travel and the ability to interface effectively in customer environment. Desirable qualifications include some combination of high tech sales/marketing experience, personal computer, Macintosh, 3270 knowledge and an M.B.A.

Your future at DCA can be a rewarding blend of challenge and opportunity. We can offer a competitive salary, comprehensive benefits plan, an in-house health club, and much more. For immediate consideration, please send your resume to: **Digital Communications Associates, Inc., Dept. 1022, 1000 Alderman Drive, Alpharetta, GA 30201.** An equal opportunity employer. Principals only. No agencies, please.

COME SEE US AT COMDEX

dca®
Digital Communications Associates, Inc

TAKE THE CTG CHALLENGE!

Become part of an exceptional team of professionals at CTG, designing and enhancing applications and systems software for Fortune 500 companies through a network of 55 offices worldwide.

We are currently looking for talented individuals with 2+ years experience in any of the following areas:

- **CICS**
- **IMS**
- **ADABAS**

If you're searching for new challenges and desire greater responsibility and a variety of assignments, look to CTG.

CTG provides an environment of stable, long term growth opportunities, in addition to, comprehensive training and a complete package of company paid benefits.

TAKE THE CHALLENGE, call or rush your resume to:

COMPUTER TASK GROUP,
3880 Vest Mill Rd., Ste. 3,
Winston- Salem, NC 27103
(919) 765-1753

Equal Opportunity Employer

CTG

LIFE 70

Programmers

- 5+ Years Exp.
Competitive Salaries
Full Time Positions

Terry McQueen
(405) 270-5303

NCC SHOW ISSUE
June 15, 1987
(Classified closing June 5, 1987)

It is being held June 15-18 in Chicago. But don't worry if you haven't advertised yet. Computerworld will have two more issues dedicated to the NCC show. They will cover everything that happened at The National Computer Conference.

These issues will inform our readers who are unable to attend NCC all about it. The happenings, speeches and all current news. Again this year we have bonus distribution of Computerworld at the show. That bonus distribution last year, meant that over 500,000 readers saw your advertisements.

COMPUTERWORLD

Classified Advertising
375 Cochituate Rd, Box 9171
Framingham, MA 01701-9171

800-343-6474

Our telecopier extensions are:

410 451
in MA (617) 879-0700
in CA (714) 250-0164
in NY (201) 967-1350
in VA (703) 876-5100

MIT's Laboratory for Computer Science has two openings:

RESEARCH ASSOCIATE

To participate in LCS' Parallel Processing group's research in investigating parallel computing using the Lisp-like programming language Multilisp. Responsibilities include: development and support of a retargetable compiler for a Multilisp-like language that can generate high-quality object code for a variety of proposed parallel computer architectures; contribute to the development and support of the associated run-time systems; contribute directly to the specification of the proposed architectures; contribute to the design and implementation of simulators for the proposed architectures; interact with other parallel computing research projects at MIT; contribute to the support and improvement of a Multilisp implementation on an existing multiprocessor; and generally contribute to the support of the group's own software and computational environment. Requirements include a Ph.D. or equivalent combination of education and experience in computer science or a related field, and experience with the design and implementation of compilers (including optimizing compilers) for Lisp-like languages onto register-based processor architectures. Must have good interpersonal and communication skills. Good working knowledge of run-time support algorithms for Lisp (such as garbage collection algorithms) and processor architecture are distinct pluses. Job number B87-273.

SYSTEMS PROGRAMMER

To work with Unix operating system in an environment including Micro VAX II's, a VAX 785, a VAX 780, a VAX 8600, and SUN stations. Responsibilities include maintaining a single copy set of sources of a local "standard" Unix "core" composed of both kernel and user level software; compiling, installing and maintaining this "Unix core" on all VAXes; assisting researchers in accessing information about Unix to support their research needs; and participating in support of networks, editors and formatters including NFS, Emacs, Scribe, TeX and Ditroff for the Unix Systems. Applicants should have a bachelor's degree or equivalent combination of education and experience. Candidates must be experienced in programming in C in the Unix environment and in maintaining large programs, especially Emac and Unix utilities. Experience with networks and protocols, as well as Emacs, Scribe, TeX, and Ditroff, a plus. Job number B87-267.

To apply, send two copies of resume to the MIT Personnel Office, E19-239, 77 Massachusetts Avenue, Cambridge, MA 02139. Please refer to the appropriate job number.

MIT is an equal opportunity/affirmative action employer.

MIT

SYSTEMS ANALYSTS
Sunbelt Opportunity

Charter Medical Corporation can offer continuing challenge and financial stability to Systems Analysts looking for the ideal combination of opportunity and growth.

Our Information Services Division approaches challenges ranging from critical package evaluations to structuring new in-house systems in areas of finance, patient accounting, and treatment outcome to meet the Corporation's aggressive development and operational strategies for our community of 82 psychiatric and acute care hospitals.

Our data processing center utilizes an IBM 3083E within an MVS/XA operating system. Systems Analysts must have 3 or more years IBM mainframe experience using COBOL, ISPF and PANVALET, ideally in a hospital clinical systems environment. Some end-user training experience is helpful. These positions are based at our corporate headquarters in Macon, GA, just 70 miles south of Atlanta.

If you would like to investigate the rewards of joining our progressive data processing team call E. Hawkins at 1-800-841-9403 (GA residents call 1-800-342-9660) or send your resume to the address below.

CHARTER
MEDICAL
CORPORATION

CHARTER MEDICAL CORPORATION
Attn: E. Hawkins, Dept. CW67-1
577 Mulberry St., P.O. Box 209
Macon, GA 31298

Equal Opportunity Employer M/F

SYSTEMS ANALYST/TECHNICAL ANALYST I: Functioning as project leader for a group of up to 4 technical employees, designs, programs, & maintains computer software & data communications facilities. Reviews & analyzes processing req's & determines equip configuration, software, & communications facilities req's. Analyzes changes & enhancements to determine impact on existing computer & communications systems, systems design, programming standards & operating procedures. Maintains installation sample systems test set. Guides computer operators in the use of systems software & communications equip. Coords installation, testing & cutover of data communications facilities & perform advance problem determination. Occasionally directs a small group of analysts. Utilize skill & exp in: MVS & VM Operations & disk storage organization & mgmt techniques; MVS Utilities, ICF, Linkage Editor & Service Aid; VM Directory Maintenance, Assembler, REXX & EXEC langs, RSCS, SMART, YES2, SMO, & ISPF/TSO. Bachelor's degree or equivalent in Computer Science w/5 yrs exp in job offered or 5 yrs exp as Systems Programmer. Employer considers Bachelor's degree in any field + 1 yr Post grad professional dvlpment course in computer programming equivalent to Bachelor's Degree in Computer Science; 35 hrs/wk, 9-5, $47,000/yr. DOT Code 012.167.066. Submit resume to: NYS Job Service, JO#NY8022738, 250 Schermerhorn St., 3rd Flr, Brooklyn, NY 11201.

Sr Analyst/Programmer

Perform systems analysis tasks obtaining/analyzing data to design and write specifications for new on-line & batch programs, conversion VSAM to database files, CICS TP monitor in large scale IBM mainframe, MVS/XA, JCL, COBOL, NATURAL environ. Reqmnts: Bachelor's degree/Computer Science + 2 yrs exp job offered or 2 yrs A/P exp to incl exp in database, CICS, JCL. 35 hr/week $43,000/yr.

Sr Analyst/Programmer

Perform systems analysis tasks obtaining/-analyzing business data for conversion computer operations; design, structure, write software for new on-line/database programs in IBM 30xx, MVS/XA, CICS/VS, COBOL, DL/1 environ. Re-write, modify, debug existing programs. Provide tech support/documentation. Reqmnts: Bachelor's degree/CS + 3 yrs exp job offered. 35 hr/week. $45,500/yr.

Lead Programmer/Analyst

Supervise team analyst/programmers. Perform systems analysis tasks obtaining/analyzing data for design & writing of specifications for new database files & conversion from VSAM to support financial systems; write CICS/COBOL programs in large scale IBM, MVS/XA, JCL environ. Responsible for documentation/preparation of user/tech manuals. Reqmnts: Bachelor's degree/CS + 2 yrs exp job offered or 3 yrs A/P exp financial systems appls to include exp in CICS, JCL, MVS. 35 hr/week. $52,000/yr.

RESUMES TO: DBL Inc., Attn: EDP Recruiter, 2 Broadway, 16th floor, NY, NY 10004.

THE PEOPLE PROJECT
Energizing Phoenix

At SRP, we've continued to provide the essential ingredients for the growth and development of our expanding community through our greatest resource...our people. Our diverse team of professionals experience career growth opportunities, our enviable southwest lifestyle and year 'round outdoor recreation.

As one of the top five public power utilities in the United States, we have remained on the leading edge of computer technology. We've teamed up the most advanced computer systems with the most talented minds.

Join us in the sunny, growing Phoenix area! For consideration, please send your resume with salary history to: **S. Kranicz, Salt River Project, Dept. CW601, P.O. Box 52025, Phoenix, AZ 85072-2025.** EOE.

Currently, we are seeking the following computer professionals:

Systems Analysts
Programmer Analysts
I.S. Tactical/Strategic Planner
Network Support Analyst
(with 2 years system programming experience)

These positions require a Bachelor's degree and at least 2 years related experience. Our current system utilizes: IBM 3090s with MVS/XA, VM, CICS, GPG, GDBS, IMS, DB2, and SQL/DS, with an extensive on-line system of PCs and terminal/printer network as well as the IBM 4381s. Our operating environment includes TSO/ISPF, VM/CMS, 4 GL support development tools such as TELON and TIF, COBOL, and a wide variety of structured methods.

SRP
SALT RIVER PROJECT

RSVP SERVICES

• Analysts • Programmers
• Software/Hardware

AWARD-WINNING EMPLOYMENT AGENTS AT YOUR SERVICE

During more than two decades of matching high tech professionals and employers nationwide, RSVP has won awards as top consultant for cooperative placements in both National Personnel Associates (240 firms) and the Middle Atlantic Assoc. of Personnel Consultants

Our services to the select group of degreed, experienced applicants we accept include resume development, arrangement of interviews, and career guidance. Sorry, no trainees, executives, or aliens without permanent resident status

If you qualify, call Howard Levin or Maureen McCue at 800-222-0153 or (in NJ) 609-667-4488, or send your resume to either address listed below. Our client companies pay all costs.

RSVP SERVICES
One Cherry Hill Mall, Suite 700,
Dept. C • Cherry Hill, NJ 08002

Dublin Hall, Suite 201, Dept.C
1777 Walton Rd. • Blue Bell, PA 19422
(mail address only)

Member Firm
npa computer/net
national placement network

System Software Experts

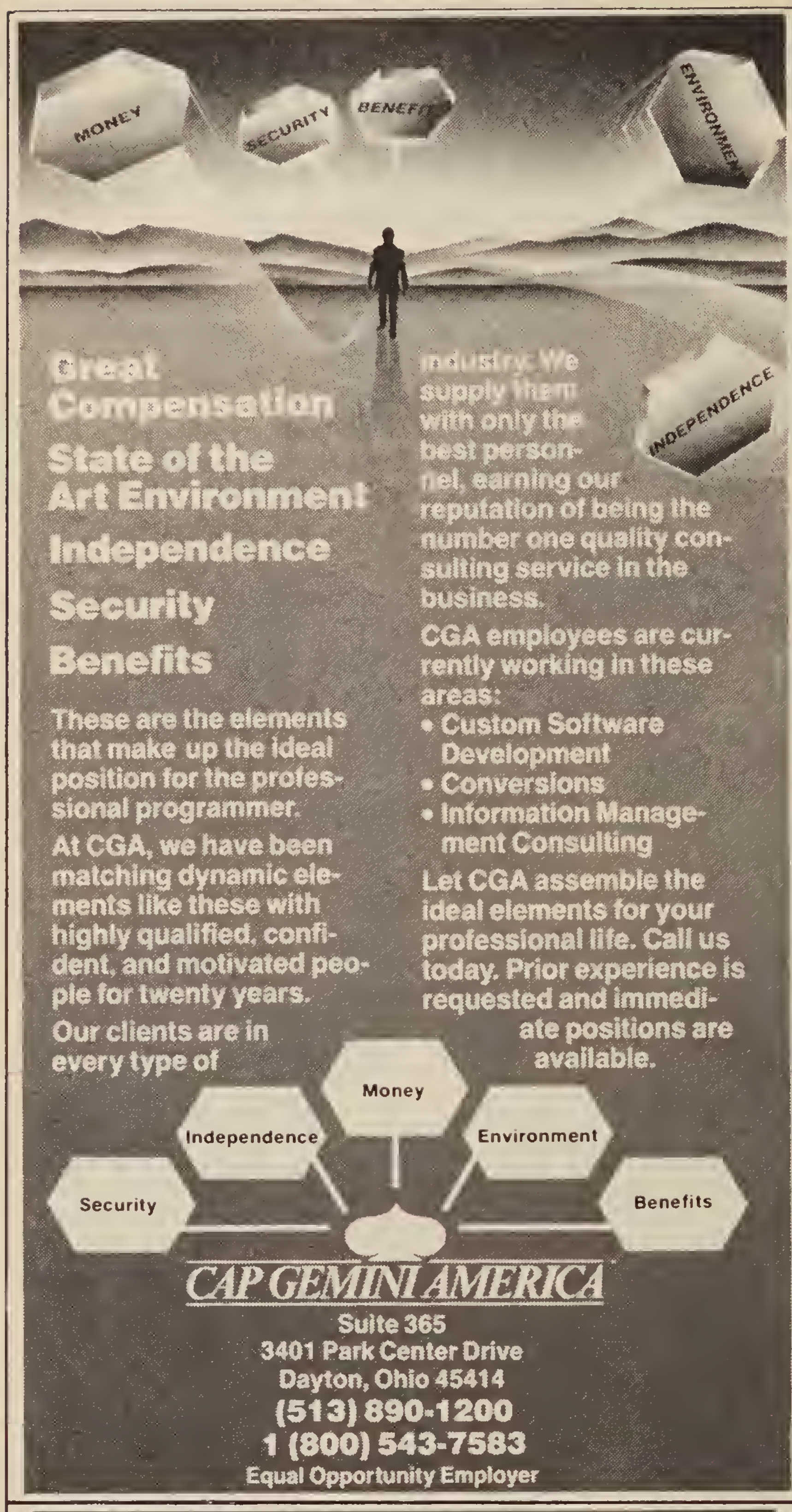
Syncsort Inc., an industry leader in high-performance system software, located in Bergen County, is seeking highly motivated professionals to work in the following areas:

- Operating System Internals (MVS/XA, VM/CMS, DOS/VSE)
- Processor/Cache Architecture
- I/O Channel Programming
- Sort/Merge Theory

If you have strong BAL skills with experience in areas listed above and are looking for challenging opportunities, please send us a confidential resume, Attention: Software Engineering - CW.

syncsort INC.

Syncsort Inc., 50 Tice Blvd., CN18, Woodcliff Lake, NJ 07675



Great Compensation

State of the Art Environment

Independence

Security

Benefits

These are the elements that make up the ideal position for the professional programmer.

At CGA, we have been matching dynamic elements like these with highly qualified, confident, and motivated people for twenty years.

Our clients are in every type of industry. We supply them with only the best personnel, earning our reputation of being the number one quality consulting service in the business.

CGA employees are currently working in these areas:

- Custom Software Development
- Conversions
- Information Management Consulting

Let CGA assemble the ideal elements for your professional life. Call us today. Prior experience is requested and immediate positions are available.

CAP GEMINI AMERICA

Suite 365
3401 Park Center Drive
Dayton, Ohio 45414
(513) 890-1200
1 (800) 543-7583
Equal Opportunity Employer

TUCSON MEDICAL CENTER

Our Information Resources Management Department is seeking qualified professionals for the following positions.

MVS Systems Programmer

MVS/XA 2.1.3 Operating System Environment

Candidate must have minimum 1 year's experience; good installation and tuning skills; experience with SYSGEN and PARMLIB changes; excellent problem determination skills; good TSO/ISPF knowledge; extensive JCL and utilities skills; expertise in SMP/e; working knowledge of BAL, COBOL, PL/1. Prefer knowledge of CICS/DL1 application environment; ACF/VTAM/NCP/3725 communications environment; NETVIEW (NCCF NPDA), UCC1/TMS, DFHSM, RACF, PCS/ADS application development environment; Milleniem/SDT application development environment.

CICS/VTAM Systems Programmer

CICS 1.7 MVS/XA System Environment

Candidate must have minimum 1 year's experience; experience with CICS tables; VTAMLST and NCPGENS; excellent problem determination skills; good TSO/ISPF knowledge; extensive JCL and utilities skills; expertise in SMP/e; working knowledge of BAL, COBOL, PL/1. Prefer knowledge of CICS/DL1 application environment; ACF/VTAM/NCP/3725 communications environment; NETVIEW (NCCF NPDA), RACF, PCS/ADS application development environment; Milleniem/SDT application development environment.

We offer excellent salaries and benefits package. Call COLLECT at (602) 327-5461, ext. 5275, Mon.-Fri., 8am-4pm for an appointment. If unable to call, send resume to: Tucson Medical Center, Personnel Services, Dept. CW0601, 5301 E. Grant Road, Tucson, AZ 85733. Equal Opportunity Employer.

IMS LEAD SYSTEMS PROGRAMMER

We have a high level technical position available in a large scale IBM MVS/XA mainframe shop where we use COBOL, IMS DB/DC, CICS, VSAM, and TSO/ISPF. Our computer center is operating in a multi-CPU environment utilizing the latest IBM hardware and software products to support a large statewide SNA network.

Qualified applicants must have 9 years of systems programming experience with 3 years of IMS systems support in an MVS environment, and proven supervisory skills. Experience in CICS support and SMP/E is a plus!

Our central Virginia location is close to Virginia Beach, the Blue Ridge Mountains, and the nation's capitol. We offer a competitive salary and benefits too numerous to list.

For confidential consideration, send resume with salary history and requirements to: Human Resources Dept.--DB, Blue Cross & Blue Shield of Virginia, P.O. Box 27401, Richmond, VA 23279.

An Equal Opportunity Employer M/F/H/V

Blue Cross®
Blue Shield®
of Virginia

Manager, Quality and Release Engineering

Plans, designs, directs, and coordinates through subordinate supervisory and engineering personnel the following activities: maintaining an extensive quantity of both systems and application software based upon a proprietary real-time based operating system; working with Customer Support personnel to troubleshoot critical customer problems; supporting Manufacturing with hardware shipments, scheduling and shipping new releases in a timely manner; enhancing existing software to meet customer requirements, and maintaining the necessary computing facilities for the Software Development organization.

Requires a Bachelor's degree in Computer Science with a minimum of two years' supervisory or project lead experience in Software Development or at least two years' experience as a Sr. Systems Software Engineer including: systems and application programming in various high and low level languages (Cobol, Fortran, RPG and Assembler), the real-time applications of computers, industry standard software testbeds. Also, the position requires knowledge of one or more of the following communication protocols: Remote Job Entry, X.25, or Ethernet. $56,000 per year/40 hours a week.

Send resume to Job Service of Florida, 105 E. Broward Blvd., Ft. Lauderdale, FL 33301, Attn: Job Order #FL 5748237.

FLORIDA OPPORTUNITIES

Progressive and respected Orlando firms are in need of the following:

DBA/IDMS/R/CICS/ADSO	$50K
P.A./IDMS/R/Culprit/COBOL	$45K
Sr S.A./MVS/CICS/IMS or IDMS+	$40K
Sys Prog./DOS/VSE/COBOL/CICS	$35K
Sr P.A./IBM PC's and mainframes	$35K
P.A./MVS/IMS DB/DC/COBOL	$35K
P.A./McCormack & Dodge/COBOL	$34K
P.A./DOS/VSE/Life 70/COBOL	$30K

All fees paid by hiring companies and submissions are held in strict confidence. For prompt consideration, please forward resume or call: Mary Holliday

ROBERT HALF
OF ORLANDO
P.O. Box 607892
Orlando, FL 32860
® (305) 628-2836

Computer Scientist

We seek a Computer Scientist to do certification of a large distributed software development environment to increase quality and reduce costs requiring software revolution and evolution techniques in software engineering, artificial intelligence and computer engineering. Requires a PhD in computer science with one year's experience in job offered or in artificial intelligence research at a college/university. 40 hours per week (work schedule: 8am-5pm). Salary is $49,000 per year. Send resumes to: Illinois Department of Employment Security, 401 South State Street-3 South, Chicago, IL 60605, Attn: Marie Ninneman, Reference #7149-N. AN EMPLOYER PAID AD. An equal opportunity employer.

DIRECTOR, MANAGEMENT INFORMATION SYSTEMS

Management position responsible for centralized comprehensive information systems. Requires college degree or equivalent and significant administrative and supervisory experience in the development and management of automated information systems. Requires knowledge of IBM 4331. Submit resume and salary history to **Personnel Director, City of Pompano Beach, 101 S.W. 1st Ave., Pompano Beach, FL 33060 305-786-4070**.

Closing Date: July 17, 1987

EDP Auditor

EDP audit position for an expanding EDP audit team in a major Colorado bank holding company headquartered in Denver. College degree in Computer Science with 2-3 years EDP audit experience in an MVS environment required. Effective oral and written communication skills needed. Position would include technical reviews of MVS, CICS, RACF, etc. We offer competitive salary and a comprehensive benefits package. For immediate consideration, please forward a resume including salary history to **S. Routa, PO Box 5168, Denver, Colorado 80217**.

Equal Opportunity Employer

SYSTEMS ENGINEER: Maintain, enhance & modify SPERRY mainframe sys. Provide efficient analysis leading to problem determination; recommend solutions &/or make necessary adjustments. Solve sys expansion req's; includes analysis of deficiencies; meeting with users & study of alternatives to existing hardware & software, testing of options, eval of alternative operational schemes & other variables. Provide mgmt w/nec recommendations. Perform duties utilizing ASSEMBLER; COBOL; SSG; EDITOR; MAP; PLUS; MAPPER; FLIT. Applicants must possess B.Sc. degree in Electrical Engineering or Computer Sci & 3 yrs exp as a Systems Engineer using SPERRY mainframe sys or 4 yrs in job offered. Applicant must have exp & knowl of ASSEMBLER; COBOL; 1100/90 INTERNALS; O/S EXEC; SSG; EDITOR; MAP; TIP; PLUS; CMS. 37½ hrs/wk. 10-6; $61,700/yr. Resumes to: Ref 101, Knight Programming Support, 800 3rd Ave, NY, NY 10022, Attn: W. Tompkins.

Programmer Systems Analyst - for system design and applications programming for designated technical projects. Procedures and backup documentation. Statistical analysis. Recommend data management policies and procedures. Assist in purchase of computer hardware and software. BA in Math or Statistics and 4 years experience. Familiarity with IBM and compatible micro computer hardware and software. Ability to program in Pascal to use statistical computer packages. Salary $31,263 pa. Job and interview site Bellmont, California. Send this ad and a resume to Job # MLU 3828, PO Box 9560, Sacramento, California 95823-0560 no later than July 1st.

Programmer/Analyst - Perform system requirements and data model analysis, design and implement the on-line, interactive systems using programming languages and software packages in the large scale of an IBM MVS and timesharing systems environment, and improve and enhance performance of the existing marketing database systems. Must have a Master's degree in Computer Science. Graduate work should include 1 course each in the following: Software Engineering, Software for Teleprocessing, Database Systems (including ER model analysis and IMS), and External Data Structure (including JCL and IBM Utilities). $2,300 per month, 40 hrs/wk, 9:00 a.m. to 5:30 p.m. Send transcripts and a resume to: Illinois Department of Employment Security, 401 South State St. - 3 South, Chicago, IL 60605. Attn: Marie Ninneman, Ref. #7078-N Employer paid Ad.

COMPUTERWORLD CLASSIFIEDS--

--PROGRAMMED TO HELP YOU

The computer industry is dedicated to developing greater efficiency and valuable time-saving resources for the business world.

Well, so are ***Computerworld Classifieds.***

And we can deal with a lot of problems. Our classifications include:

Employment Today -- To help you find the computer professionals right for you.

Positions Wanted -- For individuals seeking full-time, permanent positions - no company ads are allowed.

Buy, Sell, Swap -- For those seeking to buy, sell or lease computer equipment.

Time & Services -- For companies who want to offer computer timesharing or other computer-related services.

Software & Software Wanted -- Used for buying & selling software packages.

Business Opportunities -- For those seeking individuals or partners in computer-related business ventures, mergers, or franchises.

Real Estate -- For those seeking to sell or lease office space suitable for computer rooms or computerized businesses.

Bids & Proposals -- Used to request for bids on equipment or to invite proposals for desired computer acquisitions.

The open line rate is $12.60 per line and there is a minimum size ad of 2 column inches (28 lines) at a cost of $352.80. Depth increases in half-inch increments and we accomodate up to 5 columns.

If you wish a box number to be assigned to your ad, it will cost an additional $15.00.

If you wish to reserve space, or would like more information, call us at **1-800-343-6474** or (in Mass.) **617-879-0700**. All materials should be sent to:

COMPUTERWORLD Classifieds
Box 9171
Framingham, MA
01701-9171

"Computerworld's audience delivers the proven professionals that we look for."

Marc Blessing
Director
CompuSearch
Cleveland, Ohio

A division of Management Recruiters International with 172 offices in the U.S., CompuSearch markets itself as the nation's largest recruitment agency devoted exclusively to MIS/DP placement. But it was not always that way, according to Marc Blessing, Director of CompuSearch.

CompuSearch needed to gain industry awareness. "*Three years ago the general public and most of the DP industry had never heard of CompuSearch. Prospective clients would often say, 'who?' when our account executives would call,*" says Marc. "*We needed national recognition and we needed a publication that would allow us to zero in on our target audience.*"

So CompuSearch started advertising in Computerworld. And it worked.

"*It worked because of Computerworld's audience,*" he explains. "*We're getting people with diverse backgrounds — from dedicated professionals with 2-3 years of programming experience to top MIS/DP management.*"

"*Computerworld's audience delivers the proven professionals that we look for,*" Marc reports.

"*Because of the new contacts that Computerworld produced on both the client and candidate sides, we decided to increase — actually double — our advertising in 1986,*" he adds. "*We've considered other publications, but we know that our dollars stretch farther with Computerworld. It allows us to hit our target audience,*" concludes Marc.

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Marc.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

A PUBLICATION OF
CW COMMUNICATIONS

“In recruitment, the bottom line is results–and that’s what you get from Computerworld.”

Janet Thompson
Management Supervisor
Bozell, Jacobs,
Kenyon & Eckhardt, Inc

For over 10 years, Computerworld has been a primary recommendation of Janet Thompson, Management Supervisor for Bozell, Jacobs, Kenyon & Eckhardt, when it comes to recruiting data processing professionals. How did such a long relationship evolve?

"Computerworld has proven itself to be the leader in terms of quality response and value for our clients' advertising dollar. In recruitment, the bottom line is results and that's what you get from Computerworld," according to Janet.

"In a tradebook campaign for systems professionals, Computerworld outpulled the other books four to one. We're not only talking quantity, but also quality and the most hires." Janet continued, *"One of our key accounts traditionally uses newsprint. But they make an exception when it comes to the data processing field. They use Computerworld on a regular basis because of its excellent cost-per-hire results."*

The recruitment staff of Bozell, Jacobs, Kenyon & Eckhardt has over 65 years experience in recruitment advertising. And they all share Janet's feeling. *"It's unanimous here. Computerworld is recognized as an essential medium for recruiting in the data processing arena. And it will continue to be a primary recommendation in the future."*

Computerworld. We're helping employers and top professionals get together in the computer community. Every week. Just ask Janet.

For all the facts, call Al DeMille, National Sales Manager, at (617) 879-0700.

COMPUTERWORLD

375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171/(617) 879-0700

A PUBLICATION OF
CW COMMUNICATIONS

SYSTEMS DEVELOPMENT PROFESSIONALS

Located in the Tampa Bay area, our continued growth has created a need for experienced Systems Development professionals that can contribute to the design of media research systems.

Our current requirements are for professionals experienced in PL/1, Model 204 data base or Micro-"C".

PL/1 PROGRAMMER/ANALYSTS

A B.S. in Computer Science, or equivalent, with a minimum of 2 years applications programming experience in PL/1 on an IBM mainframe in an MVS environment.

MODEL 204 PROGRAMMER/ANALYSTS

A B.S. in Computer Science, or equivalent, with a minimum of 2 years experience in the analysis, design and development of applications using Model 204 User Language or File Manager (FLODS). Model 204 Systems Manager and IFAM experience is a plus.

MODEL 204 DATA BASE SPECIALIST

A B.S. in Computer Science, or equivalent, with 3 or more years of Systems Development experience in an M204 environment. A minimum of one year experience in the design of M204 data base files is required. Experience using Dictionary 204 is a plus.

MICRO-"C" PROGRAMMER/ANALYSTS

A B.S. in Computer Science, or equivalent, and 2 or more years of Micro-"C" programming using Microsoft or Lattice is required. Design, development and testing of applications programs on an IBM PC or compatible hardware is essential.

All positions require good oral and written communication skills.

We offer competitive salaries and benefits. For further consideration, please send a current resume, with salary history to:

NIELSEN MEDIA RESEARCH, Human Resources Dept. CW601, 375 Patricia Avenue, Dunedin, FL 33528. an equal opportunity employer m/f/v/h.

Nielsen Media Research

a company of
The Dun & Bradstreet Corporation

THE CONSULTING ORGANIZATION WITH A DIFFERENCE!

Experience the difference in consulting with CSX Technology - a large, progressive company that has all the resources to meet your needs. We're the commercial data services unit of CSX Corporation - America's leading transportation and natural resources company. CSX Technology is rapidly becoming a leader in providing a wide range of consulting services to FORTUNE 500 and government clients throughout the Southeast.

CSX currently has the need for data processing professionals with 2+ years experience in any of the following areas:

- IMS DB/DC
- CICS
- DB2
- UNIX/XENIX
- TECHNICAL WRITER
- HP 3000
- ASSEMBLER
- COBOL
- TANDEM/PATHWAY
- PROJECT MANAGER

If your skills match any of these requirements and you are sincere in a career as a Consultant with an employer on the leading edge of technology, you owe it to yourself to check us out. As part of our team you will have access to our in-house educational facilities, an attractive compensation plan, and outstanding company benefits.

Your success depends on you taking the first step. Call us today at **(904) 632-8699** or send your resume to:

CSX
TECHNOLOGY

CSX TECHNOLOGY
Professional Services Division
550 Water Street, Suite 500
Jacksonville, Florida 32202
Attention: Karen Kelley
Director - National Recruiting

* Offices in Raleigh, Charlotte, Columbia, Nashville, Tampa, and Louisville

* Equal opportunity employer

CONTRACTORS NEEDED NOW FOR

- IDMS ADSO
- FOCUS
- ORACLE
- VAX VM
- CICS DL/1
- IMS DB/DC
- S38/S36/S34
- CICS (GENER/OL)

call or send resumes to
Roger Setzer

DP RESOURCES, INC.

929 S. Main Street
Burlington, NC 27215
(919) 222-8063

It's Your Move...

NC-VA-SC-TN-GA-FL

...and we can help you make it! For over 15 years we have been placing data processing people like you in the Southeast. We have **IBM 30XX, 43XX, S/36, S/38** positions for **P/A, S/A, S/P** So, like we said, **"IT'S YOUR MOVE"** Call collect or mail resume to

Dunhill 919-885-9075

P.O. Box 6012
High Point, NC 27262

EDP AUDITOR

Women & Minorities
Are Encouraged To Apply

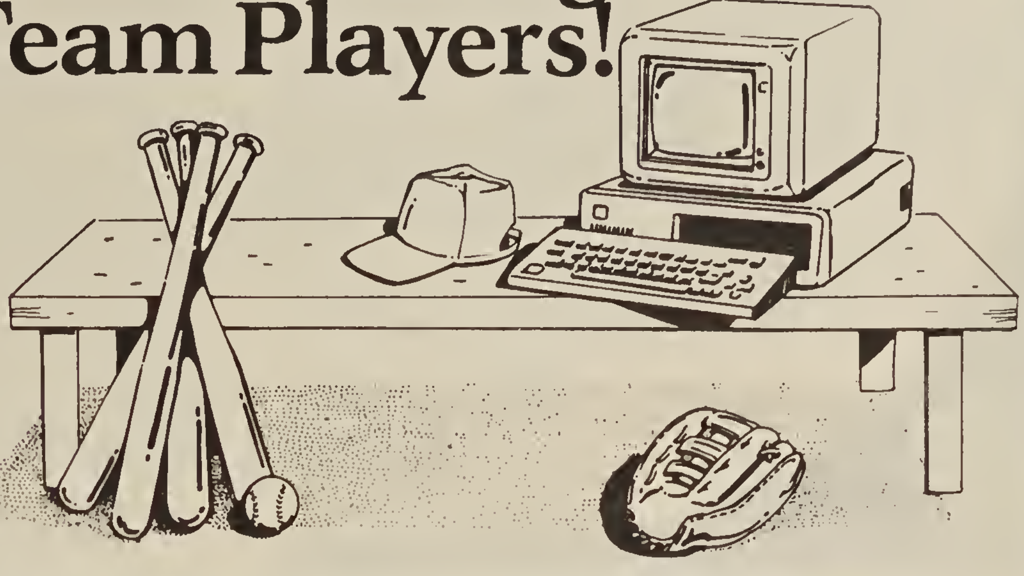
Audit computer systems and programs used by City departments. Requires 3 years of experience auditing EDP systems AND a related Bachelor's degree. Salary range is $33,756 to $41,070 with excellent benefits. City of Milwaukee residency required within 6 months. For application materials contact Kathy Warnke, Personnel Department, Room 706 City Hall, 200 E. Wells Street, Milwaukee, WI 53202-3554 or call 414/278-3372 AS SOON AS POSSIBLE. An Affirmative Action Employer.

SUNBELT OPPORTUNITIES

DEC MACRO II Real Time	$30K
IBM S/36 RPGII IBM PC	$30K
IBM 43XX COBOL CICS	$36K
IBM 43XX COBOL VSAM	$30K
IBM 30XX COBOL MVS/XA	$35K
IBM S/38 RPG3 MAPICS	$36K
EDP Auditor IBM PROG	$43K

ROBERT HALF
OF LOUISIANA
P.O. Box 57629
New Orleans, Louisiana 70157
504-835-4296

Here's The Pitch... We're Looking For Team Players!



Fidelity Systems Company is looking for team players who can hit the ground running and make a visible contribution to an already top-rated organization. We're building one of the largest data processing organizations in Dallas and want an all out team effort enhanced by individual contribution. If you are a Systems Programmer who desires the challenges our state-of-the-art operation can offer, you belong on the Fidelity Team.

We're part of Fidelity Investments, one of the nation's largest and fastest growing investment companies. With responsibility for more than 65 billon dollars in investments for more than three million individual, corporate and bank clients, we can only afford to recruit the best. Join the company with a winning strategy. We'll put forth a team effort that produces outstanding results every time.

SYSTEMS PROGRAMMING

CICS Project Leader
Will be responsible for overall direction of the CICS Systems Programming Group. Requires 5 + years related experience with previous project leadership/supervisory experience preferred. Should be proficient in all aspects of CICS Systems Programming including gens, installations, program products, etc. Knowledge of LU6.2 a plus.

Sr. CICS Systems Programmer
The successful candidate must be able to handle all aspects of CICS including installations, program products, gens, debugging and performance tuning. Must have heavy CICS internals knowledge with 5 years related experience.

Sr. VTAM/NCP Programmer
Responsibilities include support for a network operating in a shared IBM (3090) multi CPU environment. Knowledge of 3725 traces and dump solving a must. Three to five years related experience required.

Sr. IDMS Systems Programmer
Requires two to five years experience on IDMS internals, sysgens and maintenance in a large IBM mainframe environment with IDMS release 10.0. Should have excellent communications skills and experience in helping define user requirements.

Sr. MVS Systems Programmer
Seeking an MVS Systems Programmer with 5 + years experience. Must have experience maintaining MVS/XA program products. Strong problem determination skills, VTAM and configuration management skills also required.

Fidelity encourages creative ideas and rewards individual contributions. Our excellent benefits program includes profit sharing, thrift plan and 100% tuition reimbursement.

If you are a seasoned professional with the skills to match our requirements, we want to hear from you. Forward your resume with salary history to:

John Ryder
Fidelity Systems Company
6001 Campus Circle Drive
Irving, Texas 75063

We are an Equal Opportunity Employer, M/F/H/V.

Fidelity Investments
Share the Vision

ATLANTA

Southeast/Southwest

If you are seeking career advancement in the data processing profession, then talk to us. We are former computer professionals who have counselled and placed hundreds of computer professionals like yourself in the 17 years since our founding in 1970. To inquire about numerous Atlanta, Dallas, Southeast and Southwest opportunities, send your resume or call us today! **DataPro Personnel Consultants, 400 Perimeter Center Terrace-Suite 650, Atlanta GA 30345. (404) 392-4242, or 12720 Hillcrest - Suite 520, Dallas TX 75230. (214) 661-8600**

DataPro
DATA PROCESSING PERSONNEL CONSULTANTS

Member of National Computer Associates

DALLAS

Research Scientist I.

M.S. in Information and Computer Science (or equivalent). Experience in the development of software engineering environments and software test tools and knowledge of program mutation test technology and the C and ADA languages. Will design/develop human-computer interfaces for state-of-the-art testing environments using a Teletype 5620 (DMD) workstation running the Layers Windowing system, a DEC VAX Station I running the X Windowing system and a SUN-3 running SUN-Windows. Will organize/publish research results, give technical reports. $35,000/yr. Apply in person or write GA Dept. of Labor, 2811 Lakewood Avenue, S.W., Atlanta, Georgia 30315, or to the nearest Georgia Job Service Center. Control GA 5206459

M I S OPPORTUNITIES

The ST. JOHNS RIVER POWER PARK, a coal fired electric generating plant located in Jacksonville, FL, utilizing MVS/XA on an IBM 4381 processor, has immediate openings in the MIS Department for the following:

• NETWORK SYSTEMS PROGRAMMER

Senior Communications Analyst to be responsible for the installation and maintenance of network software which currently includes ACF/VTAM and ACF/NCP. Participate in the planning and implementation of future network additions including network design and NCP gens. Must have experience in MVS, CICS and MVS/XA.

• DATA BASE SYSTEMS PROGRAMMER

Senior Systems Programmer to be responsible for the installation and maintenance of IMS/VS data base software and related products. Participate in the planning and implementation of data base recovery facilities such as DBRC. Must have experience in MVS, CICS and MVS/XA.

• PROGRAMMER ANALYST

Several years of experience in the development and enhancement of financial and/or engineering applications. Experience with MVS/XA, COBOL, TSO, ISPF, CICS, IMS, JCL, EASYTRIEVE, PANVALET or IBM's AS. Restoration work force/maintenance planning a plus.

Respond, including salary history and requirements to:

ST. JOHNS RIVER POWER PARK
Personnel Department
P.O. Box 26888
Jacksonville, FL 32218-0888

EEO/AA Employer M/F

Programmer/Analyst RPG

A unique opportunity exists to join the world's largest winery in a responsible position offering an excellent compensation package and ideal living conditions in a non-metropolitan area.

This person will assist in the design, programming and implementation of remote distribution and accounting systems in a centralized programming staff supporting multiple System 36 installations on a national basis (networked systems). Requires a minimum of two years' RPG II experience utilizing on-line screen design (#SFGR), SEU, DFU, and all standard utilities. Need systems development experience in the financial systems area. PC exposure would be a plus. Emphasis will be on technical depth. Anticipated travel of 25%.

Please send resume and salary history, in confidence, to: **Professional Staffing Department, E. & J. Gallo Winery, P.O. Box 1130, Modesto, CA 95353.**

E. & J. GALLO WINERY

An equal opportunity employer m/f/h.

SPECIALIZED PROJECTS REQUIRE SPECIAL PEOPLE

SYSTEMS TRAINING SERVICES (STS), specializes in FINANCIAL SYSTEMS SUPPORT AND TRAINING SERVICES, including: Needs Assessment, Project Management, Installation Support, System Documentation, as well as a unique Customized Training Program. We currently need consultants in the following areas:

- New York Metropolitan
- New England
- Philadelphia

with expertise in MSA's Financial Systems, such as General Ledger, A/P, Payroll, Fixed Assets and IE.

For further information, please contact:

SYSTEMS TRAINING SERVICES, INC.
10 Forest Avenue
Paramus, New Jersey 07652
(201) 368-9432

PAN AMERICAN UNIVERSITY

Systems and Operations Manager

Technical manager in charge of operations and systems management. Responsible for systems software, hardware including Vax 8700 Cluster, DEC-10 & Ethernet LAN, and all production/operations activities. Bachelor's in computing & science/math/business with four years or more experience in the field required. Previous experience should show heavy emphasis in system software (prefer TOPS-10 or VMS), operations and hardware. Some systems manager training provided. Salary range 30,000 - 33,000.

Senior Programmer Analyst

Programming Team Leader developing and maintaining administrative information systems. Major role in conversion from in-house developed COBOL-68/74 systems under TOPS-10 to Packaged systems in VAX COBOL. Bachelor's in computing and business/-math/science with four years progressively complex software development experience. Proficiency in the analysis, design and implementation of on-line systems using COBOL required. Experience with development tools, DBMS, fourth generation languages, decision support systems desirable. VMS related training available. Salary range 24,000 - 25,100.

Pan American University is an EEO/AA.

CONTACT: **Personnel Office**
Pan American University
1201 W. University Dr.
Edinburg, Texas
(512) 381-2551 or **(512) 381-2556**

POSITION WANTED

Data processing professional seeks Model 204 and IDMS projects

Prefers projects involving both DBMS.

Write SBF;
1010 Wolverton A;
Boca Raton, FL 33434
or call (305) 487-2078.

CLASSIFIED ADVERTISING ORDER FORM

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Real Estate, and others).

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines. Any special artwork should be enclosed with your ad also. Logos must be submitted on white bond paper for best reproduction.

Cost: Our rates are $176.40 per column inch. (Each column is 1 13/16") Minimum size is two column inches (1 13/16" wide by 2" deep) and costs $352.80 per insertion. Extra space is available/and billed in half-inch increments and costs $88.20. Box numbers are $15.00 extra per insertion.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE, or a Purchase Order Number. Any extensions on this policy must be made through our Credit Department.

________ columns wide by ________ inches deep.

Issue Date(s): ________

Section: ________

Name: ________

Company: ________

Title: ________

Address: ________

____

Telephone: ________

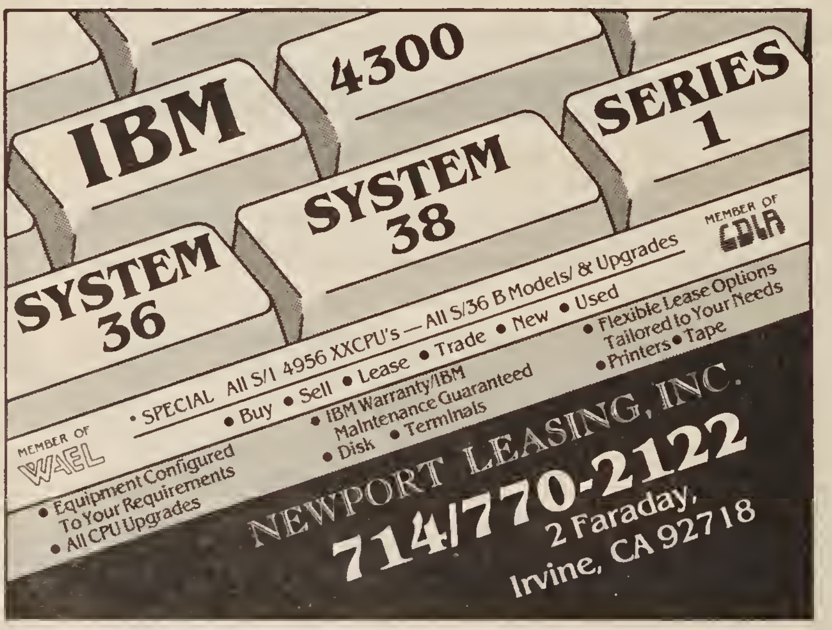
Send this form to:

COMPUTERWORLD
CLASSIFIED ADVERTISING
375 Cochituate Road, Box 9171
Framingham, MA 01701-9171

Telecopier service is available.

Call: 800-343-6474 or 617-879-0700
extension 410 or 451

BUY SELL SWAP


IBM
4300
SERIES 1
SYSTEM 38
SYSTEM 36
MEMBER OF CDLA
• SPECIAL All S/1 4956 XXCPU's — All S/36 B Models/ & Upgrades
• Buy • Sell • Lease • Trade • New • Used
• IBM Warranty/IBM Maintenance Guaranteed
• Disk • Terminals
• Flexible Lease Options Tailored to Your Needs
• Printers • Tape
MEMBER OF WAEL
• Equipment Configured To Your Requirements
• All CPU Upgrades
NEWPORT LEASING, INC.
714/770-2122
2 Faraday,
Irvine, CA 92718

Inflation Fighters

Quality & Savings

Slightly used, Money Back Guarantee. Full Reels. All External Labels Removed Guaranteed for use at 1600 BPI through 6250 BPI.

2400' Reel	**$4.95 ea.**
1200' Reel	**$4.50 ea.**
600' Reel	**$3.75 ea.**

All Tapes with Hanging Seals

We pay freight on orders over 200 tapes.
All orders shipped within 48 hours.

Call or Write

Computer Tape Mart
44A Seabro Avenue
N. Amityville, New York 11701
[516] 842-8512

IF YOU'RE BUYING, WE'RE SELLING.
36
38
4300
IF YOU'RE SELLING, WE'RE BUYING.

IBM SYSTEMS Buy • Sell • Lease **PERIPHERALS**

(800) 331-8283 TOLL FREE **(213) 306-9343** CALIFORNIA

Ocean Computers, Inc.
8055 W. Manchester Ave., Ste 525,
Playa Del Rey, CA 90293

CDLA

BUY SELL TRADE

DEC PDP-11

SYSTEMS
PERIPHERALS
COMPONENTS

dce DIGITAL COMPUTER EXCHANGE INC
27773 Industrial Blvd Hayward CA 94545
CALL (415) 887-3100
FAX (415) 887-5590
DEC PDP-11 ™ of Digital Equip Corp

IBM HARDWARE
BUY • SELL • LEASE

SERIES-1
S/34 • S/36
S/23 • POS

AMCOM CORPORATION
5555 WEST 78TH STREET
MINNEAPOLIS, MN 55435
612-829-7445 **800-328-7723**

SOUTHERN DATA SYSTEMS
2712 Landers Ave. Nashville, TN 37211
(615) 244-3012

'. . . where quality service is a classical tradition'

SYSTEM 34 36 38
All Related I/O

MAINFRAME I/O
Terminals Printers
DASD Controllers

S/23 DATAMASTER
PC/XT/AT 5110/5120
DISPLAYWRITER

(Call Us Toll Free, Today !)

800-251-2614

SALE or LEASE
9370
MODEL 20 or 60
JULY SHIP
CALL TOM
800- 262-9945
818- 716-9944 CA
PREMIER COMPUTER SALES

For Sale
IBM
System 36
Model B-24

(1) 8809, (1) 3262, (5) 5291 Model 2, (2) 5291 Model 1, (6) 3791, (1) 6502 200 CPS

All Or Part

(305) 587-1100
Mr. Phil Bolin, DP Manager

DEC
IBM
DG

New & Used
Computers

(305) 392-2005
TELEX 156 1249
thomas business systems, inc.

dda DIGITAL DEALERS ASSOCIATION

4301 OAK CIRCLE • UNIT 11 • BOCA RATON, FL 33431

The Dana Deal. It'll blow you away.

When you buy, sell or lease a 36, 38 or 43XX—discover how Dana Deals. Quickly. Reliably. With expert service and installation. Experience the Dana Deal. Just pick up the phone. Call **(800) 433-4148** outside California. And fasten your seatbelt.

LOS ANGELES, CA
(213) 212-3111
DALLAS, TX
(214) 248-8588
STAMFORD, CT
(203) 359-8040
COLUMBUS, OH
(614) 899-0204

Dana
MARKETING

IBM SPECIALISTS

SELL • LEASE • BUY

S/34 S/36 S/38
3741 3742

- New and Used
- All Peripherals
- Upgrades and Features
- IBM Maintenance Guaranteed
- Immediate Delivery
- Completely Refurbished

800-251-2670
IN TENNESSEE (615) 847-4031

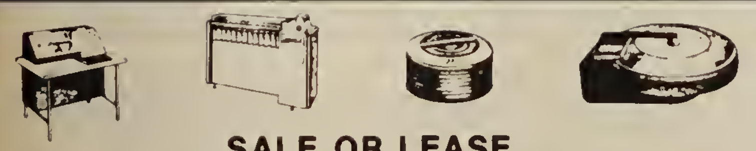
ascd MEMBER AMERICAN SOCIETY OF COMPUTER DEALERS

CMA
COMPUTER MARKETING
of America, Inc.

P.O. BOX 71 • 610 BRYAN STREET • OLD HICKORY, TENNESSEE 37138

IBM UNIT RECORD EQUIPMENT

DISK PACKS—DATA MODULES—MAG.TAPE—DISKETTES



SALE OR LEASE

IBM UNIT RECORD MACHINES
026—029—082—083—084
085—087—088—129—514
519 – 548 – 557 – 188

NEW & USED
DISK PACKS—DATA MODULES
2316—3336(1)—3336(11)—3348(70)
MAG. TAPE-DISKETTES
Every Item Guaranteed

Highest Prices Paid for Used Packs & Modules

THOMAS COMPUTER CORPORATION
5633 W. Howard St.
Chicago, IL 60648
800-621-3906
(IL-312-647-0880)

HONEYWELL

LEVEL 6 DPS 6 SERIES 16

- Complete Minicomputer Line - New & Used
- All Peripherals and Terminals
- Upgrades and Features
- Depot Repair Capability
- Honeywell Maintenance Guaranteed
- Immediate Delivery Low Prices

* NEW PRODUCT *
Full Line of
AT and XT Compatible PC'S

The Recognized Leader in Honeywell
Minicomputer Sales and Support

BCS
BOUDREAU COMPUTER SERVICES
100 Bearfoot Rd., Northboro, MA 01532
(617) 393-6839 TWX 710-347-7574

WE DO BUSINESS WITH A SHARP PENCIL

COI OFFERS FOR SALE OR LEASE THE FOLLOWING IBM PRODUCTS:

☑ SERIES/1
☑ SYSTEM/36
☑ 4300
☑ SYSTEM/38
☑ 9370
☑ SYSTEM/34

COI
COMPUTER OPTIONS, INC.
800-328-4358
612-941-1099

How

HOW DO YOU KNOW YOU'RE GETTING THE BEST DEAL?
HOW DO YOU GET A QUICK PRICE QUOTATION?
HOW DO YOU GET FAST DELIVERY?
HOW DO YOU KNOW YOUR EQUIPMENT IS GUARANTEED?
HOW DO YOU KNOW WHAT TO BUY?
HOW DO YOU KNOW WHOM YOU'RE DEALING WITH?
HOW DO YOU KNOW YOU WILL BE SATISFIED?

CALL US...
WE'LL TELL YOU HOW

WE BUY · SELL · LEASE
34 · 36 · 38 · SERIES 1 · 4331-4381
ALL PERIPHERAL EQUIPMENT
ALL UPGRADES

CALL: 800-238-6405
IN TN: 901-372-2622
IN NC: 919-884-0879

CB
COMPUTER BROKERS INC.
2978 SHELBY ST.
MEMPHIS, TN 38134
"SINCE 1974"

ascd

MISSISSIPPI CENTRAL DATA PROCESSING AUTHORITY

Sealed proposals will be received by the CDPA, 301 N. Lamar St., 301 Building, Suite 508, Jackson, MS 39201 for the following equipment and services.

Request for Proposal No. 1231, due Friday, June 12, 1987 at 3:30 p.m. for the acquisition of a MicroVax II or equivalent capable of running the VAX/VMS operating system for the Department of Electrical Engineering at the UNIVERSITY OF MISSISSIPPI. No charge.

Request for Proposal No. 1232, due Monday, June 15, 1987 at 3:30 p.m. for the acquisition of 80286 based microcomputer systems to equip a lab to facilitate instruction in both MS-DOS based software and PC-to-host 3270 based concepts for the CENTRAL DATA PROCESSING AUTHORITY INSTITUTE. $10.00

Detailed specifications may be obtained free of charge from the CDPA office or at the specified cost by submitting a written request accompanied by the appropriate payment. **NOTE: Valid forms of payment are corporate check on a Mississippi bank, certified check or POSTAL money order. NO CASH OR OUT-OF-STATE CHECKS.** The CDPA reserves the right to reject any and all bids and proposals and to waive informalities.

Patsy Stanley @ **(601) 359-2604** or
Colleen Downing @ **(601) 359-2624**

★ Buy ★ Sell ★ Lease ★ Rent

IBM. Displaywriters

5525 — OFFICE SYSTEMS
5219 — 5253 — 5258

6670 PRINTERS

SYSTEM/34/36

CDB FINANCIAL, INC.
3520 DILIDO ROAD
DALLAS, TEXAS 75228
214-324-3491
Member: COLA-NOMDA

1-800-426-USED

In California (714) 641-0366

IF IBM MAKES IT, WE CAN SAVE YOU MONEY

Series/1
System/34
System/36
System/38
43 XX
30 XX

- *Top Savings*
- *Quick Delivery*
- *Short and Long-Term Leases*
- *All Models & Peripherals*
- *New & Used*

ML&A

Marshall Lewis
& Associates, Inc.

CDLA Member Computer Dealers & Lessors Association

1536 Brookhollow Drive, Building A
Santa Ana, Ca 92705-5426

IBM BUY · SELL · LEASE

36
4300
38
SERIES 1

- Processors
- Peripherals
- Upgrades

DEMPSEY & ASSOCIATES

183¨ Beach Blvd. Suite 323 • Huntington Beach, CA 92648 **(714) 847-8486**

BURROUGHS

BUY ● SELL ● LEASE

Systems * Processors * Peripherals

- ● All "A" Series
- ● All Peripherals
- ● All Terminals
- ● All Convergent Technology
- ● All BX800 & BX900 Series

"June Specials"
B9484-51 206 Disk Drive
B9494-41 207 Disk Drive
B6925-B5925-B1985
Burroughs B20 Memory Upgrades
B20-B21-B22-B25-B26 etc.
Depot Maintenance

Universal Financial
375 W. 1st St., Elmhurst, IL 60126
1-800-558-5656 (312) 279-1160

---

* DEC

BUY - SELL
TRADE -LEASE
NEW/USED
SYSTEMS PERIPHERALS

Time Electronics, Inc.

MA: 617-342-4210
OH: 614-764-2224

* DEC is a Registered Trademark of Digital Equipment Corp

Lee Data Equipment

- Exceptional Discounts

Controllers,
Displays, Printers

Sale or Lease

- Short Term Leases Available

First Alliance Corporation

call: Mary Foxworthy
619-487-8030

DATA COMM
MODEMS & MUXES
Warranteed
813-937-8318

19200 BAUD W/8 PT STAT MUX	$1800
9600 BAUD W/4 PT TD MUX	$800
9600 BAUD MULTI-POINT DIAG	$750
9600 BAUD POINT TO POINT	$349
4800 BAUD MULTI-POINT	$250
4800 BAUD POINT TO POINT	$275
STATISTICAL MULTIPLEXORS	
MICOM AND COMPRE-COMM	
2 CHANNEL @ 9600/19200	$330
4 CHANNEL @ 9600/38400	$600
8 CHANNEL @ 9600/38400	$700
12 CHANNEL @ 9600/38400	$950
16 CHANNEL @ 9600/38400	$1200
MISCELLANEOUS	
BATTERY BACKUP TOPAZ 1 KW	$700

ESPI

FOR SALE

Immediate Availability

SIDEREAL: 2 Micronet 8 Workstations, 3 yrs old

NORCOM System: 2 TI 810 Printers, 1 Square D Topaz Line 2 Power Conditioner, 1 Star Technologies Nano*Star 10 CPU, 6 Soroc SRC 530 CRT & Kybd, 1 Racal Vadic modem, 2 yrs old

call **(312) 407-4397**

We Buy & Sell
DEC
Systems
Components

call:713
445-0082
600 Kenrick Ste C22
Houston, Tx 77060

Digital
Computer
Resale

BIDS & PROPOSALS

STATE OF CONNECTICUT
DEPARTMENT OF
ADMINISTRATIVE SERVICES
REQUEST FOR PROPOSAL Ref. No. IS103

DEVELOPMENT OF A
TELECOMMUNICATIONS
WIRING STANDARD

The Department of Administrative Services is soliciting proposals from firms with extensive experience in telecommunications distributed wiring design and standards development to assist the State in developing a telecommunications wiring standard for voice, data and, to a limited extent, video transmission. Proposing firms should have in-depth knowledge of major existing standards.

Proposal submission deadline is 3 PM E.T. July 1, 1987.

Parties interested in receiving a Request for Proposal are to contact:

William Cannon
Chief of Bidding & Contracts
165 Capitol Avenue, Room 524
Hartford, CT 06106
Tel. **(203) 566-2346**

3704
3705 3725
BUY • SELL • LEASE
Call Toll-Free
800 532-7532
In Minnesota Call 612/829-2800
Centron DPL Company
Member CDLA

For Sale
CDC CYBER
180/830
mainframe

w/8 megabytes memory, 1 CPU, 20 peripheral processors, 12 external I/O channels and console.

Currently in operation and under maintenance. Runs NOS + NOS/-VE. Removal and transportation will be responsibility of buyer.

Call Gary Edelen 303-491-7231

*** DEC**

8650-CDAP
Fully Refurbished By DEC*
List · $528 K
Comes with VMS 4.5 and DecNet
Includes 90 day warranty
Along with factory installation
Ready to ship
CALL FOR SPECIAL PRICING

Time Electronics, Inc.

MA: 617-342-4210
OH: 614-764-2224

* DEC is a Registered Trademark of Digital Equipment Corp

For Sale
IBM System 36
- Mdl 5360-B13

Features: 1006, 4550,
(3) 4552, 4560

Available Now

Call Tom Tolbert
(317) 782-2149
PolyGram Records Inc.

THE BULLETIN BOARD

NCR

FOR SALE
NCR MAINFRAME
8645----8 Meg of Memory (1 Meg Boards) 2 EA. CCP, 1 EA. TCCP w/Low Speed Trunk, and Optional MCCP/High Speed Trunk, Dynamic Channel Exchange.
BSL 6831 Card Reader

PERIPHERALS

658-201
6589-0101
647-0201
6540 (135 MB)
624-0401
635-0209
621-0903
621-0101
692-0600
ASYNC ADAPTERS

Deliverable July 1, 1987

Please respond to
CW-B4921, Computerworld,
Box 9171, Framingham,
MA 01701-9171

HEWLETT PACKARD

S/70 & S/68
Also
HP 2392A Terminals
Qty. Available
Quantity Pricing Available

All in stock - immediate delivery
Subject to prior sale
All warranted to qualify for manufacturer's maintenance

BUY * SELL * RENT * LEASE
Processors * Peripherals * Systems
From the HP 3000 Experts!
800/643-4954 213/829-2277
ConAm Corporation
It's Performance That Counts!

HP 3000 • 1000
9000 *and now* **250**
Buy & Sell Worldwide
ENCORE
(213) 452-9117
Telex 756927

WANG

HOLSON ASSOCIATES, INC.
Buy And Sell
Guaranteed
For Wang Maintenance
2470 Windy Hill Road, Suite 253
Marietta, GA 30067
Call: Richard Holley or Carole Benson
(404) 980-1700

BUY - SELL
MVP/LVP • OIS • VS • PC
SYSTEMS IN INVENTORY
VS-45 • OIS • VS-100
GENESIS
EQUIPMENT MARKETING
GEM
(602) 277-8230

PRIME

LARGE SELECTION OF USED PRIME COMPUTER SYSTEMS
...SAVINGS TO 50%
Peripherals also available
1st SOLUTIONS, INC.
11460 N. CAVE CREEK RD.,
PHOENIX, ARIZONA 85020
(602) 997-0997
ASK FOR DON

TSI...YOUR FULL LINE VENDOR
FOR ALL YOUR
PRIME COMPUTER NEEDS
Buy • Sell • Lease • Rent

National	800-222-3475
Florida	800-421-4135
Northeast	800-874-3475

Timesharing Services, Inc.
4080 Woodcock Drive
Jacksonville, Fl 32207

MISC.

NEW & USED
RAISED FLOORING
Immediate Delivery
Quality Installation
RAISED COMPUTER FLOORS
One Charles Street
Westwood, NJ 07675
(201) 666-8200
Telex #13-5076

DATA GENERAL

NPA SYSTEMS INC.
for the SALE, LEASE, PURCHASE & SERVICES OF DATA GENERAL EQUIPMENT
(516) 467-2500 (NY)
(415) 848-9835 (CA)
DISASTER PLAN & FACILITY MANAGEMENT ALSO AVAILABLE
' We'll Pay Top $ For MV Systems '

New 10/23/86 **Under Full Maint.**
MV/4000 32 Bit Processor 4Mb Memory, (2) 592Mb Subsystems, Battery Backup, 1600/6250 BPI Mag Tape Subsystem, (2) IAC-16 Terminal Interface, IAC-8 Remote Terminal Interface, (15) D/215 Terminals, 300 LPM Printer Subsystem
Plus Software & Cabinetry
Call (219) 982-2107

SPERRY UNIVAC

Sperry System 80
Full Compliment Of Peripherals
System Is Available In July
For More Information Please Contact
Frank Fiammetta **(415) 330-4127**
VWR Scientific, PO Box 7900,
San Francisco, CA 94120

UNIVAC 90/60 VS9
COMPLETE SYSTEM
FOR SALE
Under Sperry Maintenance
Available In August
For More Information Contact
Duane Swanson (213) 683-1560

QANTEL

BUY SELL LEASE
QANTEL/NEC
CALL PROMPT COMPUTER
Dan Kobie
(216) 248-2595

MISC. SYSTEMS

Special - 9766's
CDC 300Mb Disk Drives
Refurbished
30 Day Warranty
Compatible With All Systems
$3,995 To $4,995.
Galaxy Computers
Buy Sell
(612) 944-3060

MISC. SYSTEMS

SALE
NIXDORF System 600/45
DPEXI (2) 66 mb disk
Terminals & Printers
Immediate Delivery
Price Open
Call Mr. White
(404) 872-4765

DEC

BUY • SELL • TRADE
Planning to buy non-DEC memory?
Check our DEC memory prices first!

1184-AA
DZO11-M
HSC5X-BA
KDF11-BE
LA180-EA
MS86-CA
MS630-CA
MS750-CA
MS750-HB
MS780-JA
MSV11-JC
RL02-AK

NEW YORK COMPUTER EXCHANGE
(516)752-8666 (800)645-9109

ORDER FORM
COMPUTERWORLD BULLETIN BOARD

Issue Date: Ads can be accepted up until the Monday preceding the issue desired. **Computerworld** comes out every Monday.

Classifications: Most ads will be classified according to the brand of equipment that is being bought or sold. These classifications include Burroughs, Data General, Digital/DEC, Hewlett Packard, Honeywell, IBM, NCR, Sperry Univac, Salvage, Terminals, Misc. Systems and Miscellaneous.

Copy: Copy sent in via the mail or telecopier (telecopier extensions are 410 and 451) should be cleanly typewritten. Ads may be given over the phone to our ad takers. The standard size is 1 column by 1 inch deep. These units may be combined to form larger sized ads. Describe the equipment very briefly, give the price and the name of the person to contact. All ads will be set up using a standard format. No borders or logos are allowed.

Cost: The price for each standard unit is $178.00 (One unit minimum and no fractional units allowed.) There are no agency commisions and no quantity discounts. There is a four (4) ad minimum per month.

Billing: Once you've written your ad, send (or call) it in with your name and address for billing purposes and we'll run it. (If your company has never advertised with us before, we request a check with your order.)

Date(s):____________________

Signature:____________________

Name:____________________

Title:____________________

Company:____________________

Address:____________________

Telephone:____________________

Send this form to:

COMPUTERWORLD BULLETIN BOARD
375 Cochituate Road, Box 9171,
Framingham, MA 01701-9171

617-879-0700 **800-343-6474**

THE BULLETIN BOARD

IBM

S/34 . S/36 . S/38
Upgrades/Peripherals
Lowest Price
Call Collect **(404) 475-7507**
Datamarc Computer Sales
785 Branch Dr, Alpharetta, GA 30201

SALE/LEASE
4361-ML-5
(12 Mb)
3-8 Comm. Lines
1-4 DASD Adapters
NOW
Peripherals Can Be Supplied
Call Bill Hegan (914) 238-9631
Computer Merchants Inc.

IBM

S/36 S/38
Buy - Sell - Lease
We Pay Cash
for your used equipment
1-800-LEAS-PAK
In Texas: 1-800-722-7811
D/FW Metro: 267-2841

PRINT TRAINS
IBM 1416 & 3216
Bought - Sold - Lease
Repaired - Reconditioned
COMPU-ACT
COMPANY, INC.
(813) 863-2461

IBM

3180
3178, 3179,
3278, 3274
All Other IBM Units Available
Call Penny 800/426-4341
In CA 408/241-3677
Marketex Computer Corp.

9375-60
2 Or 3 Year Lease
(2) 9335A01, (6) B01
16 Mb - Avail 7/24/87
Western Computer Leasing
(602) 997-7245

IBM

Private Party For Sale
IBM 4361 (LO3) Computer
4 Megabytes,
Many Features Including 1200,
1601, 3201, 3202, 3701 (4), 4695 (4)
Available Immediately
Times Mirror Company
R. Miller (213) 237-3808

BUY ● SELL ● SAVE $
IBM DISPLAYWRITERS
34'S, 36'S, 38'S
5525 Systems
5219 Printers, 5253-1 Terminals
LRK RESOURCES UNLTD INC.
713-437-7379
800-523-8903

IBM

S/38 S/36 S/34
SERIES 1
BUY - SELL - LEASE
Systems, Peripherals & Upgrades
Source Data Products Inc.
800 Menlo Avenue # 200
Menlo Park, CA 94025
800/328-2669 415/326-7333

9370's For Lease
Available September
3279-S3G's
Sell/Lease
Bluebonnet Computer Co.
(512) 926-3900

IBM

SALE/LEASE
3380-AA4
3380-B4 3880-3
Call Howard King
(914) 238-9631
Computer Merchants Inc.

Your Ad
Could Be Here
For
$178.00

TIME, SERVICES & SOFTWARE

IBM* CICS* Users!!
A 'SUPER' CEMT TRANSACTION

SEMT does everything CEMT does . . . and more.

(1) All normal CEMT functions conversationally;

PLUS

(2) A non-conversational facility for use in sequential terminals, at system consoles, or from COMMAND-level programs;
(3) Full-screen, selective, pageable 'INQ TAS' display (with individual or mass (FORCE) PURGE and TIOA browse);

PLUS

(4) Full-screen display of TCLASS attributes (with online add/chg/del capability);
(5) Full-screen Temp-Storage UT display (with TS queue copy/browse /edit);
(6) Full-screen displays of AID/ICE, Deferred, and DCA tasks/transactions;
(7) Sequential Terminal reusability;

PLUS

Too much more to enumerate here!

All this for only $999.99

Call NOW: (312) 692-7800

CICS GOODIES
P. O. Box 925 • Park Ridge, IL 60068
*IBM & CICS are registered trademarks of IBM Corp.

VAX TIME
5¢ PER CPU SECOND
OR
$800.00 PER MONTH FIXED-RATE
- MOST MAJOR LANGUAGES
- PROGRAMMING AVAILABLE
- NATIONWIDE ACCESS

medcom Information Systems, Inc

Ask for Cheryl at (714) 998-6041

VAX TIME
- 8600, 785 and 780 Computers
- Rates from $5.00/Hour
- Timeshared or Dedicated
- Tymnet Access Available
- Hotsite Backup Services

AMERICAN DIVERSIFIED
Costa Mesa, California

CONTACT: KEN CHARLTON
(800) 426-5890 Outside Calif.
(800) 345-2265 Calif. Only

DEC SPECIALISTS
VAX 8600 & PDP-11
TIME SHARING
NO CPU CHARGES
$7/$10
RSTS/E VMS
PER HOUR
CONNECT TIME
BUDGET BYTES®
212-944-9230
EXT. 110

☐ TIMESHARING
☐ GENERAL CONSULTING
☐ SOFTWARE DEVELOPMENT
☐ FACILITIES MANAGEMENT
☐ COMPUTER EQUIPMENT & SUPPLIES
☐ HARDWARE MAINTENANCE (NY METRO AREA)
☐ MEDIA CONVERSION
☐ EXECUTIVE SEARCH
☐ SOLOMON ACCOUNTING SOFTWARE

Omnicomputer, Inc.®
1440 Broadway, New York, N.Y. 10018

Innovative Computer Techniques

COMPUTER SERVICES
IBM 3081 DEC-10
VAX 8600
- Batch Processing
- Timesharing
- Public Network Access
- Laser Printing

Route 202, Raritan, N.J. 08869
201-685-3400. Contact: Joyce Bogeenko

CONVERSION SPECIALISTS

AUTOMATED CONVERSIONS
TAILORED TO YOUR NEEDS
DOS TO MVS
HONEYWELL TO IBM DOS OR MVS
OTHER LANGUAGE/SOFTWARE CONVERSIONS

CUSTOM PROGRAMMING
COBOL DOS
RPG II MVS
CICS CMS

BELCASTRO COMPUTER SERVICES
120 MILLCREEK ROAD
NILES, OH 44446
(216) 652-1628

How to increase your power without paying the price.

Turn to Manufacturers Hanover Data Services Corporation for low-cost, state-of-the-art timesharing and Information Center services.

- Secure environment
- Software includes MVS/SP, VM/SP, VM/XA, TSO, GDDM, CMS, and Presentation Graphics Equipment
- Processing done on IBM 3084 MX3 and IBM 4381 systems
- Accessible via many telecommunications methods
- Volume discounts

For more information write:
Jeff Daum
Manufacturers Hanover Data Services Corporation
P.O. Box 26
Carlstadt, New Jersey 07072

Or call (201) 896-2030

MANUFACTURERS HANOVER

IBM is a trademark of International Business Machines Corporation

© 1987 Manufacturers Hanover Trust

COMPUTING SERVICES

CPU 1	CPU 2
MVS/XA	VM/370
CICS	DOS/VSE
IMS	CICS
TSO	CMS

** IBM HARDWARE
** FULL TECHNICAL SUPPORT
** FOURTH GENERATION LANGUAGES
** NATIONWIDE ACCESS
** GUARANTEED RESPONSE AND AVAILABILITY
** FULL DISASTER RECOVERY BACKUP
** ON-SITE CUSTOMER AREA
** FULL SECURITY
** VOLUME AND TERM DISCOUNTS

For more information please contact
BURNS COMPUTING SERVICES, INC.
10 Gould Center
Rolling Meadows, IL 60008
Midwestern Sales (312) 981-5260
Eastern Sales (212) 432-1151 • (215) 398-3600

R&R
Repair and Refurbishment
Mainframes ▪ Minis ▪ Micros ▪ Peripherals
- Over 3,000 makes & models
- Board repairs to system overhauls
- Fixed & floppy drive repairs
- Class 100 clean room
- No order too large or small
- Fast, professional, *affordable* service

1-800-523-0254
In Pennsylvania (215) 265-6601
Sorbus®
A **Bell Atlantic™** Company
50 East Swedesford Road
Frazer, PA 19355

COMPREHENSIVE COMPUTER RESOURCES AND SERVICES

Need to maximize capacity without additional capital outlay?

***BethSystems** will put 20 years of leading edge technology to work for you. We've got the cost effective service/solutions you want!*

- Large scale IBM capability

MVS/XA	IMS DB/DC	VM/370
JES 2	DB 2	CMS
TSO	FOCUS	SAS
CICS	DISOSS	PROFS

- Technical and network support
- 24-hour customer "HELP" desk
- Resource/facility management
- Engineering computing services
- Intergraph CAD/CAM—Graphics
- Consulting Services

Call (215) 694-7500
BethSystems
1642 Martin Tower • Bethlehem, PA 18016

Why Pay More?

Take advantage of the latest hardware and software tools at our world class data center.

Realize immediate cost saving benefits by processing at our shared resource facility on IBM 3081 and 3090 computers in an MVS/XA environment.

- Full CICS, IMS, DB2 Services
- Service Level Guarantees
- Extensive Network Capabilities
- Client Help Desk Facility

Get The Facts—FREE!
Call Toll Free 800-225-7135
In Colorado (303) 430-8881

Security Pacific Information Systems, Inc.
1401 Del Norte Street
Denver, Colorado 80221

COMPUTERWORLD
SALES OFFICES

Publisher/President/Lee Vidmer

Vice President/Sales/Edward P. Marecki, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, (617) 879-0700

BOSTON SALES OFFICE Northern Regional Manager/Michael F. Kelleher, **District Managers**/David Peterson, Bill Cadigan, Sherry Driscoll, **Account Manager**/John Watts, **Sales Assistant**/Alice Longley, **COMPUTERWORLD**, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

CHICAGO SALES OFFICE Midwest Regional Manager/Russ Gerches, **District Managers**/Kevin McPherson, Larry Craven, **Sales Assistant**/Kathy Sullivant, **COMPUTERWORLD**, 2600 South River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

NEW YORK SALES OFFICE Eastern Regional Director/Michael J. Masters, **Senior District Manager**/Doug Cheney, **District Managers**/Fred Lo Sapio, Frank Genovese, **Account Manager**/Paula Smith, **Sales Assistants**/Mary Tagliareni, Sue Larson, **COMPUTERWORLD**, Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

LOS ANGELES SALES OFFICE Western Regional Director/William J. Healey, **District Manager**/Carolyn Knox, **COMPUTERWORLD**, 18004 Sky Park Circle, Suite 255, Irvine, CA 92714 (714) 261-1230

SAN FRANCISCO SALES OFFICE Western Regional Director/William J. Healey, **Senior District Manager**/Barry Milione, **District Managers**/Ernie Chamberlain, Mark V. Glasner, Stevan Phillips, **Account Manager**/Alicia Hodge, **COMPUTERWORLD**, 300 Broadway, Suite 20, San Francisco, CA 94133 (415) 421-7330

ATLANTA SALES OFFICE Eastern Regional Director/Michael J. Masters, **District Manager**/Jeffrey Melnick, **Sales Assistant**/Melissa Christie, **COMPUTERWORLD**, 1400 Lake Hearn Drive, Suite 330, Atlanta, GA 30319 (404) 394-0758

DALLAS SALES OFFICE Midwest Regional Manager/Russ Gerches, **District Manager**/Kevin C. Harold, **COMPUTERWORLD**, 14651 Dallas Parkway, Suite 304, Dallas, TX 75240 (214) 233-0882

WASHINGTON D.C. SALES OFFICE Eastern Regional Director/Michael J. Masters, **District Manager**/Bernie Hockswender, **COMPUTERWORLD**, 3022 Javier Road, Suite 210, Fairfax, VA 22031 (703) 280-2027

PRODUCT CLASSIFIED ADVERTISING Product Classified Advertising/Account Manager Peter Slingluff, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING National Recruitment Sales Director/John Corrigan, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

RECRUITMENT ADVERTISING SALES OFFICES
New England Recruitment Manager/Al DeMille
375 Cochituate Road, Box 9171, Framingham, MA 01701-9171 (617) 879-0700

New York Recruitment Manager/Warren Kolber
Paramus Plaza 1, 140 Route 17 North, Paramus, NJ 07652 (201) 967-1350

Midwest
2600 S. River Road, Suite 304, Des Plaines, IL 60018 (312) 827-4433

Western Recruitment Manager/Barbara Murphy
18004 Skypark Cicrle, Suite 100, Irvine, CA 92714 (714) 250-0164

Mid-Atlantic Recruitment Manager/Kathryn Kress
3110 Fairview Park Drive, Suite 1040, Falls Church, VA 22042 (703) 876-5100

RECRUITMENT TELEMARKETING ACCOUNT EXECUTIVES
New England, New York/Jay Novack, **Mid-Atlantic**/Pauline Smith
Midwest/Ellen Casey, **Western**/Nancy Percival
Toll Free: 1-800-343-6474 or (617) 879-0700

……

FOREIGN EDITORIAL/SALES OFFICES

Argentina: Ruben Argento, CW Communications S/A, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: (011) 54 134-5583. Telex: (390) 22644 (BAZAN AR).

Asia: Euan Barty, Asia Computerworld Communications Ltd., 701-4 Kam Chung Bldg., 54 Jaffe Road, Wanchai, Hong Kong. Phone: (011) 852 5 861 3238. Telex: (780) 72827 (COMWOR HX).

Australia: Alan Power, Computerworld Pty. Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (011) 61 2 4395133. Telex: (790) AA74752 (COMWOR).

Austria: Manfred Weiss, CW Publikationen Velagsgesellschaft m.b.H., Josefstadter Strasse 74, A-1080 Wien, Austria. Phone: (011) 43 2224B6 5910. Telex: (847) 115 542 (SCH/A).

Brazil: Ney Kruel, Computerworld do Brazil, Rua Alcindo Guanabara, 25-11 andar, 20.031 Rio de Janeiro, RJ 8razil. Phone: (011) 55 21 240 8225. Telex: (391) 21 30838.

Denmark: Preben Engell, Computerworld Danmark A/S, Torvegade 52, 1400 Copenhagen K, Denmark. Phone: (011) 45 1955 695. Telex: (855) 31566.

France: Jean-Louis Rendon, Computerworld Communications S.A., 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, France. Phone: (011) 33 14 747 1272. Telex: (842) 613234 F.

Hungary: Dezso Futasz, Computerworld Informatika Co., Ltd. H-1536 Budapest, Pf. 386, Hungary. Phone: (011) 36 1 228 458. Telex: (861) 22 6307 (KSHP H).

Italy: Dr. Bruno Fazzini, Computer Publishing Group S.R.L., Via Vida 7, 20127 Milano, Italy. Phone: (011) 39 02 2613432. Telex. (843) 335318.

Japan: Mr. Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone: (011) 81 3 551 3882. Telex: (781) 252-4217 (Computerworld Japan only).

Steven Yamada, Tokyo Representative Corp., Sanshin Kogyo Jimbocho 3F, Chiyoda-ku, Tokyo 101, Japan. Phone: (011) 81 3 230-4117/4118. Telex: (781) J26860 (reps for all CWCI publications except Computerworld Japan).

Mexico: Henry Morales, Computer Mexico S.A. de C.V., Oaxaca 21-2, Mexico City 7 D.F. Colonia Roma, 06700 Mexico. Phone: (905) 514-4218 or 6309. Telex: (383) 177 1300 (ACHAME).

The Netherlands: Wout Berends, CW Communications 8.V., van Eeghenstraat 84, 1071 GK Amsterdam, The Netherlands. Phone: (011) 31 20 646426. Telex: (844) 18242 (CWCOM NL).

New Zealand: Reg Birchfield, CW Communications Ltd., 13 Maidstone St., Grey Inn, Auckland 1, New Zealand. Phone: (011) 64 9 768 993. Fax: (011) 64 9 780 244.

Norway: Morten Hansen, CW Norge A/S, Hovinveien 43, P.O. Box 2862, Toyen, 0608 Oslo 6, Norway. Phone: (011) 472 647725. Telex: (856) 76476 (CW NOR N).

People's Republic of China: Chen Mingkun, China Computerworld, 74 Lu Gu Road, Box 750, Beijing 100039, People's Republic of China. Phone: (011) 47 814 6174. Telex: (716) 222214 (CCW CN).

Spain: Francisco Zabala, Computerworld Espana, Rafael Calvo 18 48, 28010 Madrid, Spain. Phone: (011) 34 1 419 4014. Telex: (831) 47894 (CW E).

Sweden: Bengt Mamfeldt, CW Communications AB, Sodra Hamnvagen 22, S-115 41 Stockholm, Sweden. Phone: (011) 46 8 67 91 80. Telex: (854) 14904 9 (NOVACW).

Switzerland: Gebhard Osterwalder, CW Publikationen AG, Witikonerstrasse no. 15, Postfach 253, CH - 8030 Zurich, Switzerland. Phone: (011) 41 1 55 10 77. Telex: (845) 816 710.

Taiwan: Leona Wang, ACE Media Agency Co. Ltd., P.O. Box 26-578 Taipei, Taiwan, R.O.C. Phone: (011) 02 751 3636. Telex: (785) 14142 (ACE GROUP). (Representative for all CWCI publications).

London: Martin Durham, CW Communications Ltd., 99 Grays Inn Rd., London, WCI 8UT, United Kingdom. Phone: (011) 44 1 831 9252. Telex: (851) 262346.

United Kingdom: Euan Rose, Beere Hobson & Associates, 34 Warwick Road, Kenilworth, Warwickshire, CV8 1HE, United Kingdom. Phone: (011) 09 26 512424. Telex: (851) 311951 (BEEHOB). (Representative for all CWCI publications).

Venezuela: Kalman von Vajna Nagy, CW Comunicaciones, C.R.L. Torre Maracaibo, Piso 13, Oficina H, Av. Libertador, Caracas, Venezuela. Phone: (011) 58 2 72 76 30.

West Germany: Eckhard Utpadel, CW Publikationen Verlagsgesellschaft mbH, Rheinstrasse 26/28, Postfach 40 0429, 8000 Munchen 40, West Germany. Phone: (011) 49 89 360860. Telex: (841) 5215350. (COMW D).

……

CW COMMUNICATIONS/INC.

Patrick J. McGovern
Board Chairman

Axel Leblois
Chief Executive Officer
CWCI, Inc.

Lee Vidmer
President
CWCI/Framingham

Vice President/Sales, Edward P. Marecki. **Vice President/Finance**, William P. Murphy.

Computerworld Headquarters: 375 Cochituate Road, P.O. Box 9171, Framingham, MA 01701-9171
Phone: (617) 879-0700, Telex: 95-1153, FAX: (617) B75-8931

SALES **Vice President/Display Sales**, Edward P Marecki. **National Recruitment Sales Director**, John Corrigan. **Display Sales Operations Manager**, Carolyn Novack. **Display Advertising Production Manager**, Maureen Carter. **Classified Operations Manager**, Cynthia Delany.
MARKETING **Director of Marketing**, Bob Singer. **Marketing Services Manager**, Audrey Shohan
COMMUNICATION SERVICES **Vice President/Research**, Jack Edmonston. **Director Research**, Kathryn Dinneen. **Sales Promotion Director**, Liz Johnson.
PRODUCTION **Production Director**, Peter Holm **Senior Production Manager**, Leigh Swearingen. **Typesetting Manager**, Carol Polack. **Art Director**, Tom Monahan.
CIRCULATION **Circulation Director**, Nancy L Merritt

ADVERTISERS INDEX

Applied Data Research 3,14
Altos Computer 66-67
Amdahl Corp. 20th/7
Ansa Software 40-41
Apollo 104-105
Artificial Intelligence 86
AST Research 52
AT&T 62-63,80-81

C.Itoh Electronics 15
Cincom 20th/C2
Codex 65
Compaq Computer Corp 46-47
Computer Associates 61
Computer Management 57
Computer Support 45
Comshare 82
Control Systems 48
Cullinet 20th/16-17
CW Circulation 77
CW France 20th/6
CW PC Business World 103
CW Spotlight 122
Cybermation 57
Cylix 76

Data Access Corp. 72
Data Design 35
Data General 20th/3
Data South 20th/26
DCA 29,30-31
Decision Data 68
DEC 54-55
Diconix 20th/C3
Duguesne Systems 38,100

Electrohome 84
Execucom 12

Federal Communication 13
Fisher International 25
4G Data 20th/19

Genesys Software 20th/24
G.E./RCA 26
Goal Systems 74

Hewlett-Packard 20th/C4
H&M Systems 127
Honeywell Bull 96-97

IDG Corporate 92-93
Information Data 42-43
Information Dimensions 32-33
Innovation Data Processing 7
Intecom 22
Interface Group 28
Interface Systems 59

JDS Microprocessing 79
Joiner Associates 78

Local Data 13,44

McCormack & Dodge 23
Metier Management Systems 58-59
Micom 64
Mid American Control Corp. 71
Miltope 20th/27

National Advanced
Systems 20th/11
National University 19
NBS Southern 90
NCR 36-37
NEC 70-71,88-89
Netec 13
Netserv 20th/23
Nynex 99

Oracle 11

Peat Marwick 60
Persoft 101

Radio Shack 20th/2
Realia 27
Relational Technology 24

SAS Institute 16-17,53
Searchlink 85
Seiko Instruments 98
Software Engineering of America 9
Software Technology Inc. 57
Sorbus 73
Syncsort 5

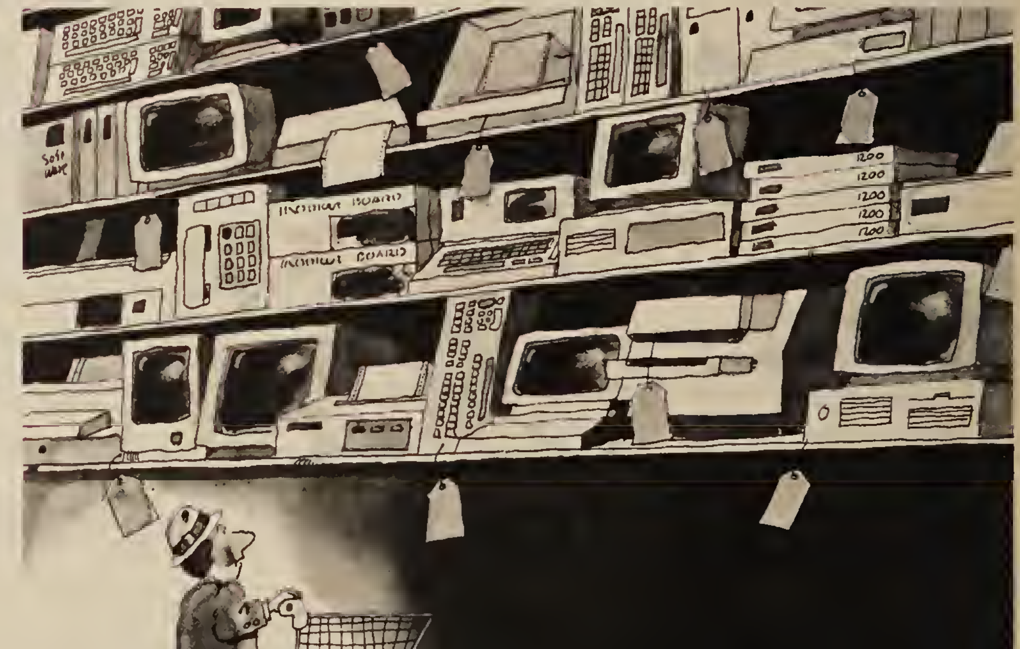
Tandon 91
Technology Transfer 19
Televideo 56
3 Com 49,50-51
3M File Management &
Systems 20th/12-13
Timeplex 102
TRW 34

Unisys 94
United 20th/6

Ven-Tel 128

Westinghouse 10
Wyse Technology 18

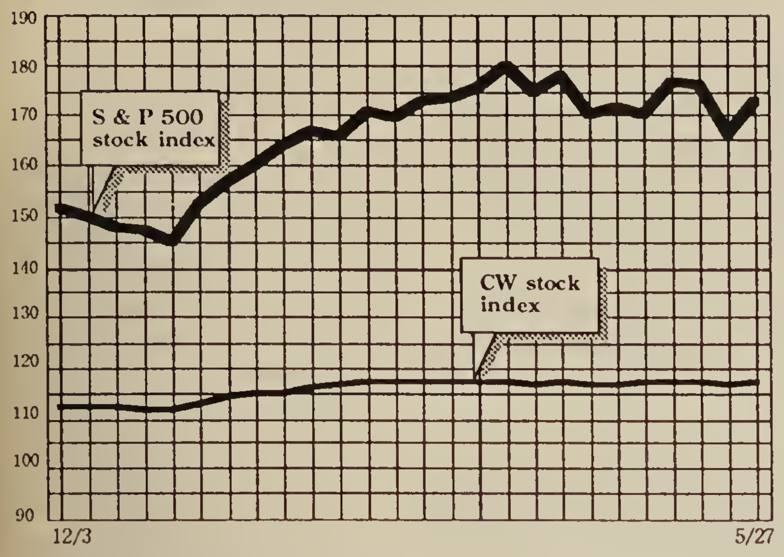
This index is provided as an additional service. The publisher does not assume any liability for errors or omissions.



Upcoming Computerworld Spotlight Sections

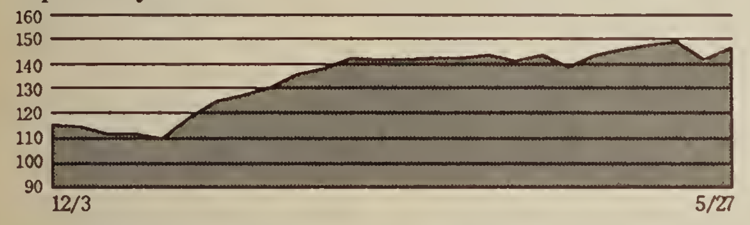
Issue Date	Topic	Ad Closing Date
June 22	Printers — Line & Character	June 5
July 6	Manufacturing Technology	June 19
July 13	Security Products & Services	June 26
July 20	Accounting & Financial Software	July 3
July 27	Graphics Workstations & Software	July 10
Aug. 3	Communications Software	July 17
Aug. 10	DBMS for Large & Medium Scale Systems	July 24

STOCK TRADING INDEX

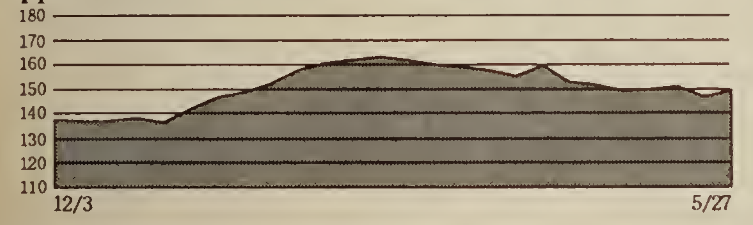


Indexes	*Last Week*	*This Week*
Computer Systems	141.9	**146.7**
Supplies & Accessories	146.8	**149.2**
Software & DP Services	128.1	**128.7**
Semiconductors	114.0	**116.1**
Peripherals & Subsystems	127.8	**128.7**
Leasing Companies	113.7	**116.3**
Composite Index	116.8	**117.1**
S&P 500 Index	166.4	**172.6**

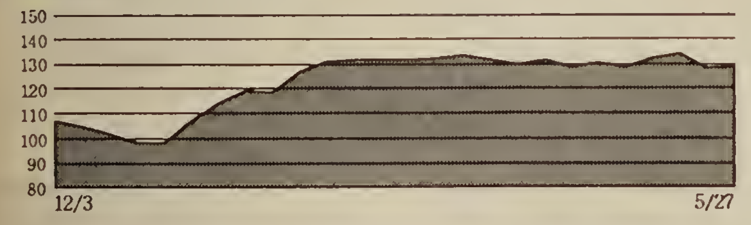
Computer Systems



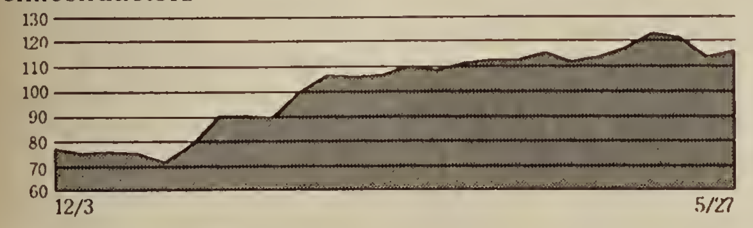
Supplies and Accessories



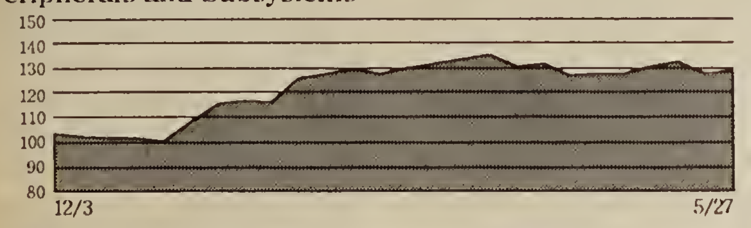
Software and DP Services



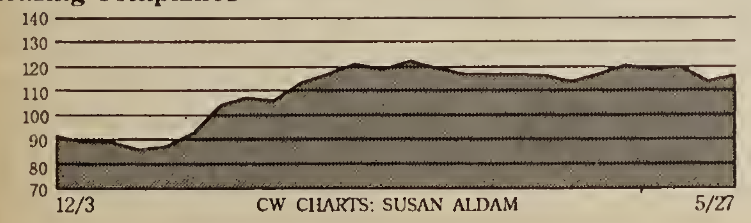
Semiconductors



Peripherals and Subsystems



Leasing Companies



CW CHARTS: SUSAN ALDAM

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, MAY 27, 1987

Computer Systems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	7	4	3.75	-0.5	-11.8
O	ALTOS COMPUTER SYS	17	10	13.00	+0.3	+2.0
A	AMOAHL CORP	42	15	35.88	+1.5	+4.4
O	APOLLO COMPUTER INC	25	9	23.13	+1.3	+5.7
O	APPLE COMPUTER INC	82	30	79.50	+5.0	+6.7
N	AT&T	28	22	25.88	+0.9	+3.5
O	C P T CORP	6	3	3.88	+0.6	+17.0
N	COMPAQ COMPUTER CORP	51	12	45.38	+1.1	+2.5
A	COMPUTER CONSOLES INC	12	7	9.88	-0.1	-1.3
O	CONCURRENT COMP CORP	19	11	17.25	+0.0	+0.0
N	CONTROL OATA CORP	35	20	32.50	+1.5	+4.8
O	CONVERGENT TECH	12	4	6.75	+0.4	+5.9
N	CRAY RESH INC	136	69	100.25	-8.3	-7.6
O	DAISY SYS CORP	13	8	9.00	+0.3	+2.9
N	DATA GEN CORP	42	25	34.88	+1.1	+3.3
N	DATAPOINT CORP	9	4	5.75	+0.8	+15.0
N	DIGITAL EQUIP CORP	175	81	160.00	+4.6	+3.0
N	FLOATING POINT SYS INC	39	11	10.75	-0.1	-1.1
N	GOULO INC	24	15	17.25	+0.3	+1.5
N	HARRIS CORP	43	27	36.13	-1.3	-3.3
N	HEWLETT PACKARO CO	66	36	64.25	+2.3	+3.6
N	HONEYWELL INC	84	58	79.75	+4.4	+5.8
N	IBM	168	116	161.00	+4.4	+2.8
O	IPL SYS INC	4	2	2.88	-0.1	-4.2
N	ITT CORP	66	44	54.63	+4.0	+7.9
N	M A COM INC	18	12	13.50	+0.0	+0.0
N	MATSUSHITA ELEC INOL LTD	136	77	131.00	+10.8	+8.9
O	MENTOR GRAPHICS CORP	34	11	30.38	+3.0	+11.0
N	N8I INC	14	8	11.13	+0.5	+4.7
N	NCR CORP	77	42	74.75	+4.0	+5.7
N	PRIME COMPUTER INC	30	16	27.38	+2.3	+9.0
O	STRATUS COMPUTER	41	18	38.50	+1.5	+4.1
O	SYM8OLICS INC	13	4	4.38	-0.1	-2.8
O	TANOEM COMPUTERS INC	75	28	73.75	+0.0	+0.0
N	TANOY CORP	56	31	40.50	+1.8	+4.5
N	TEXAS INSTRS INC	203	103	175.00	+2.3	+1.3
A	ULTIMATE CORP	35	13	23.13	+0.9	+3.9
N	UNISYS CORP	125	58	119.25	+6.0	+5.3
A	WANG LABS INC - B	19	11	17.50	+0.9	+5.3
A	WANG LABS INC - C	19	11	17.13	+0.5	+3.0
N	XEROX CORP	81	49	78.25	+4.8	+6.5

Supplies & Accessories

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMER 8USINESS PRODS	33	23	28.88	+0.4	+1.3
N	8ARRY WRIGHT CORP	24	14	18.50	+0.5	+2.8
A	OUPLEX PROOS INC	22	18	19.38	+0.6	+3.3
N	ENNIS 8USINESS FORMS INC	23	14	19.25	-0.6	-3.1
N	3M CO	140	99	129.50	+2.5	+2.0
N	MOORE LTO	27	20	24.00	+0.8	+3.2
O	STANOARO REGISTER CO	53	32	45.75	+1.8	+4.0
N	WALLACE COMPUTER SVCS	50	37	42.75	-0.3	-0.6

Software & DP Services

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
O	ADVANCEO COMP TECH	7	3	4.56	+0.1	+1.4
N	AOVANCEO SYS INC	22	12	18.50	+0.1	+0.7
N	AGS COMPUTERS INC	45	17	42.63	+1.6	+4.0
O	AMERICAN MGMT SYS INC	38	13	36.00	+0.3	+0.7
O	AMERICAN SOFTWARE INC	22	7	16.13	+0.4	+2.4
N	ANACOMP INC	9	3	8.25	+0.5	+6.5
O	ANALYSTS INTL CORP	11	4	9.75	+0.3	+2.6
O	ASHTON TATE	30	10	24.75	+0.0	+0.0
O	ASK COMPUTER SYS INC	17	9	12.25	+0.0	+0.0
O	ASTRAOYNE COMP INO	3	1	1.31	+0.1	+7.7
N	AUTOMATIC OATA PROC	51	29	45.00	+2.1	+5.0
O	8OOLE & 8A88AGE INC	11	4	9.50	+0.0	+0.0
N	COMPUTER ASSOC INTL INC	28	10	26.63	+1.3	+4.9
O	COMPUTER HORIZONS CORP	15	10	12.50	-0.3	-2.0
O	COMPUTER NETWORK TECH	9	4	4.63	-0.1	-2.6
N	COMPUTER SCIENCES CORP	61	30	51.25	+1.4	+2.8
N	COMPUTER TASK GROUP INC	19	11	16.00	+0.5	+3.2
O	COMSHARE INC	18	11	16.00	+0.5	+3.2
N	CULLINET SOFTWARE INC	16	6	12.13	+1.6	+15.5
O	CYCARE SYS INC	17	7	7.75	-0.3	-3.1
O	OUQUESNE SYS INC	33	12	27.00	+1.0	+3.8
N	GENERAL ELEC CO	56	35	51.25	-48.8	-48.8
N	GENERAL MTRS CORP (CLASS E)	49	24	41.88	+1.1	+2.8
O	HOGAN SYS INC	17	9	15.50	+0.1	+0.8
O	INFORMATION SCIENCES INC	4	1	0.94	-0.1	-6.2
O	INFOTRON SYS CORP	17	7	11.00	+0.5	+4.8
O	KEANE INC	16	5	9.25	+0.3	+2.8
N	LOGICON INC	38	22	26.88	-0.3	-0.9
O	LOTUS OEV CORP	37	9	34.50	+2.6	+8.2
O	MANAGEMENT SCI AMER	21	12	13.38	+1.3	+10.3
O	MCI COMM CORP	11	5	6.38	+0.0	+0.0
O	MICOM SYS INC	18	10	14.88	-0.1	-0.8
O	MICRO PRO INTL CORP	8	2	7.06	-0.2	-2.6
N	MICROSOFT CORP	128	26	109.50	+0.0	+0.0
O	NATIONAL OATA CORP	27	16	22.25	+0.1	+0.6
N	ON LINE SOFTWARE INT	27	10	24.88	-1.6	-6.1
O	ORACLE SYS CORP	30	7	25.00	+1.0	+4.2
N	PANSOPHIC SYS INC	23	12	21.25	+2.3	+11.8
O	POLICY MGMT SYS CORP	30	15	25.25	+1.8	+7.4
O	PROGRAMMING & SYS INC	13	8	10.50	+0.0	+0.0
O	REYNOLOS & REYNOLOS CO	42	27	33.00	-1.3	-3.6
O	SCIENTIFIC COMPUTERS INC	8	4	7.50	-0.3	-3.2
O	SEI CORP	33	15	33.25	+3.3	+10.8
O	SHAREO MEO SYS CORP	53	23	24.75	-3.0	-10.8
O	SOFTWARE AG SYSTEMS INC	20	10	11.25	-0.6	-5.3
O	SOFTWARE PU8G CORP	17	5	15.00	+0.3	+1.7
A	STERLING SOFTWARE INC	21	9	10.25	-0.4	-3.5
N	SUNGUARO OATA SYSTEMS	21	10	19.00	+0.5	+2.7
N	UCCEL CORP	36	18	31.50	-0.5	-1.6
N	URS CORP	21	13	16.25	-0.4	-2.3
O	VM SOFTWARE INC	45	16	29.50	-1.0	-3.3

Semiconductors

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	AOVANCEO MICRO OEV	27	13	21.13	+1.0	+5.0
N	ANALOG OEVICES INC	24	14	21.50	-0.4	-1.7
O	ANALOGIC CORP	13	10	10.88	-0.3	-2.2
N	APPLIEO MAGNETICS CORP	40	13	35.50	+0.9	+2.5
O	AVANTEK INC	20	13	13.88	+0.5	+3.7
O	HAOCO CORP	7	3	5.88	-0.1	-2.1
O	INTEL CORP	48	16	42.50	+0.8	+1.8
O	MICRO MASK INC	7	2	6.75	+0.1	+1.9
N	MOTOROLA INC	64	34	56.75	+3.4	+6.3
N	NATIONAL SEMICONOUCTOR	17	8	13.88	-0.3	-1.8
N	TERAOYNE INC	29	16	27.38	+1.8	+6.8

EXCH: N = NEW YORK; A = AMERICAN; P = PACIFIC; 8 = 8OSTON;
L = NATIONAL; M = MIOWEST; O = OVER-THE-COUNTER; S = SPLIT

O-T-C PRICES ARE 8IO PRICES AS OF 3 P.M. OR LAST 8IO
(1) TO NEAREST OOLLAR

Peripherals & Subsystems

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
A	AM INTL INC	9	5	6.50	+0.3	+4.0
A	ANDERSON JACOBSON INC	4	1	2.13	-0.1	-5.6
O	AST RESH INC	23	11	20.25	+1.8	+9.5
O	AUTOTROL CORP	10	5	9.50	-0.1	-1.3
O	AVANT GARDE COMPUTING	7	3	3.75	+0.0	+0.0
O	BANCTEC INC	16	6	14.13	+1.6	+13.0
N	BOLT BERANEK & NEWMAN	60	37	43.75	-0.3	-0.6
A	CETEC CORP	7	5	5.50	-0.1	-2.2
A	COGNITRONICS CORP	5	2	4.75	+0.9	+22.6
N	COMPUGRAPHIC CORP	24	16	23.75	+2.4	+11.1
N	COMPUTERVISION CORP	23	10	16.88	+1.4	+8.9
N	CONRAC CORP	30	12	27.13	+0.0	+0.0
A	OATAPRODUCTS CORP	18	10	10.25	+0.0	+0.0
A	OATARAM CORP	17	7	7.38	+0.1	+1.7
O	OATA SWITCH CORP	9	5	6.75	-0.4	-5.3
O	OATUM INC	7	4	6.25	+0.5	+8.7
N	DECISION INDS CORP	15	7	7.63	+0.0	+0.0
O	ENDATA INC	10	5	9.75	-0.4	-3.7
O	EMC CORP	34	11	27.25	+0.5	+1.9
O	EVANS & SUTHERLANO	40	20	29.63	-1.3	-4.0
N	FLOATING POINT SYS INC	39	11	10.75	-0.1	-1.1
O	GANOALF TECHNOLOGIES	11	5	8.50	+0.1	+1.5
N	GENERAL DATACOMM INO	15	8	12.38	+0.8	+6.5
O	ICOT CORP	13	5	6.50	+0.1	+2.0
O	INFORMATION INTL INC	18	13	13.75	-0.3	-1.8
O	INTERLEAF INC	20	8	19.13	+0.8	+4.1
O	MEGAOATA CORP	7	2	4.81	-0.1	-1.3
A	MSI OATA CORP	17	10	14.25	-0.1	-0.9
N	NASHUA CORP	31	21	29.13	+1.3	+4.5
O	NETWORK SYS CORP	19	9	8.75	-0.1	-1.4
N	NORTH AMERN PHILIPS CORP	46	35	42.38	-0.1	-0.3
N	NORTHERN TELECOM LTO	23	13	19.38	-17.4	-47.3
O	NOVELL INC	27	9	24.25	+0.0	+0.0
N	PARADYNE CORP	11	4	6.63	+0.4	+6.0
A	PENRIL CORP	8	4	5.00	+0.3	+5.3
N	PLESSEY PLC	41	24	35.25	-4.8	-11.9
O	PRINTRONIX INC	14	10	11.50	-0.3	-2.1
N	QMS INC	18	11	15.13	+0.3	+1.7
O	RAMTEK CORP	6	4	4.50	+0.3	+5.9
N	RECOGNITION EQUIP INC	27	10	18.50	+0.6	+3.5
O	SCAN TRON CORP	19	11	11.25	-0.3	-2.2
N	SCIENTIFIC ATLANTA INC	19	9	16.50	-0.1	-0.8
O	SEAGATE TECHNOLOGY	45	10	42.38	+2.1	+5.3
N	STORAGE TECHNOLOGY	5	2	4.00	-0.3	-5.9
O	SUN MICROSYSTEM INC	44	11	43.00	+0.8	+1.8
A	T-8AR INC	8	5	8.00	+0.0	+0.0
A	TAB PROOS CO	21	12	17.13	-0.8	-4.2
O	TANOON CORP	8	2	5.63	+0.1	+2.3
A	TEC INC	6	3	3.50	+0.3	+7.7
N	TEKTRONIX INC	43	27	33.88	+0.1	+0.4
O	TELEVIOEO SYS INC	4	2	2.63	-0.1	-4.5
N	TELEX CORP	102	52	74.75	+0.8	+1.0
N	TIMEPLEX INC	41	14	34.25	-0.3	-0.7
N	TITAN CORP	10	6	5.88	-0.1	-2.1
O	WYSE TECH	33	13	32.25	+2.6	+8.9

Leasing Companies

EXCH		52-WEEK RANGE (1)		PRICE CLOSE MAY 27 1987	WEEK NET CHNGE	WEEK PCT CHNGE
N	COMOISCO INC	33	15	29.88	+0.9	+3.0
N	CONTINENTAL INFO SYS	13	7	11.88	+0.8	+6.7
O	PHOENIX AMERN INC	8	3	4.88	-0.3	-4.9
O	SELECTERM INC	8	5	5.50	+0.4	+7.3
N	U.S. LEASING	53	38	49.00	-0.5	-1.0

Darling Unisys

Merged Burroughs, Sperry unit hot item on first anniversary

Exactly one year after Burroughs Corp. acquired Sperry Corp. and the investment community was extremely skeptical about the future of the resulting merged company, Unisys Corp. is now a darling on Wall Street.

Unisys stock shot up 11 points in three trading days last week to 122⅝, more than double its low of 57½ within the past year.

Investors have obviously reacted favorably to Unisys's debt-reduction moves, which have proceeded faster than originally planned.

Also fueling the recent bullishness were the ratings upgrades of several classes of Unisys debt by Chicago-based investment banking firm Duff and Phelps, Inc. and the declaration of a 93-cent dividend on Unisys Class A preferred stock by the Unisys board of directors last week.

At the other end of the New York Stock Exchange's computer stock spectrum is Floating Point Systems, Inc.

After reporting another quarterly loss recently, the Beaverton, Ore., scientific computer maker dropped to 10½ points in Thursday's trading, matching its low for the year.

CLINTON WILDER

ADAPSO, IIA merger a tough juggling act

Road to successful junctions often pitted with staff cuts, ego clashes, CEO selection difficulties

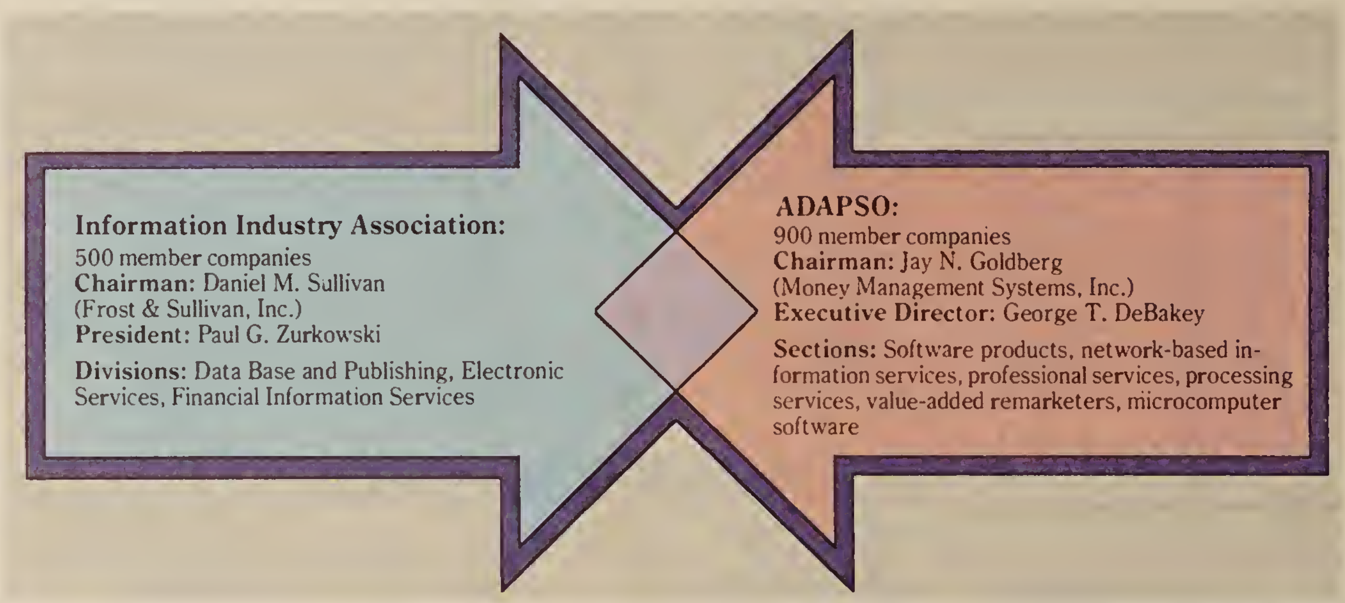
BY MITCH BETTS
CW STAFF

ANALYSIS

WASHINGTON, D.C. — If recent attempts at mergers of trade associations are any indication, the proposed union of the Information Industry Association (IIA) and ADAPSO will be no easy trick.

Merger team

Organizations of IIA and ADAPSO indicate interests of each group



Information Industry Association:
500 member companies
Chairman: Daniel M. Sullivan
(Frost & Sullivan, Inc.)
President: Paul G. Zurkowski
Divisions: Data Base and Publishing, Electronic Services, Financial Information Services

ADAPSO:
900 member companies
Chairman: Jay N. Goldberg
(Money Management Systems, Inc.)
Executive Director: George T. DeBakey
Sections: Software products, network-based information services, professional services, processing services, value-added remarketers, microcomputer software

CW GRAPHICS: SUSAN ALDAM

The executive committees of both organizations moved to consolidate some activities late last month in the first step toward a merger that would create an association of nearly 1,400 vendors. But it appears that merging trade associations is at least as difficult as merging corporations, according to association management experts. They point to numerous association mergers — both inside and outside the computer industry — that have been proposed but never completed.

"More of them fall apart than go through," said James E. Mack, president of American Trade Association Management, a management firm in Potomac, Md.

Merger hurdles

The experts say that association mergers — involving hundreds of company members and associated egos and sensibilities — are frequently killed by disputes over such issues as who will be the chief executive, who will be cut when the staff is consolidated and who will be on the board of directors.

For example, the IIA once considered absorbing the Videotex Industry Association as a division, but the videotex group vetoed the idea because its leaders did not want to be dominated by IIA, according to IIA sources.

ADAPSO and the Software Publishers Association also considered a merger, according to a former ADAPSO official, but it was scotched when ADAPSO's business-oriented software vendors said they did not want to mix with vendors of entertainment and games software.

Meanwhile, the U.S. Telecommunications Suppliers Association and the Electronic Industries Association's Information and Technologies Group continue to discuss a possible merger. But the negotiations are reportedly in a "tenuous" state as members debate such issues as dues, revenue, structure and staffing.

Mack said that proposed mergers typically fail if one party fears being dominated by the other, the groups lack common interests or cohesiveness or the parties fear the consolidated group will be too unwieldy.

Conversely, Mack said, successful mergers involve groups with common interests that will make a combined association more effective and involve "give and take" by both partners.

In recognition of the difficulties of the task ahead, IIA and ADAPSO are cautiously "testing the feasibility of integration" on a small scale. "By first integrating the meetings and chapter activities, the associations could determine benefits and anticipate problems in the broad range of activities that publishers, computer service companies and other key players would have working together in one association," said the notice distributed to members [CW, May 25].

Supporters of the IIA-ADAPSO merger say it would bring various members of the information services community together to share expertise about how to make their products and services more successful.

"It appeared to each of the associations that there is a tremendous community of interests. IIA companies are in the business of supplying information, which has evolved to become the editorial and data function combined with software and delivery," said Robert S. November, an IIA member and executive vice-president of the American Banker/Bond Buyer news organization in New York.

Since ADAPSO members are involved in software and delivery services, there is an overlap of interests, November said.

Furthermore, the overlap is illustrated by the fact that several companies are members of both associations, including The Dun & Bradstreet Corp., Source Telecomputing Corp., IBM, AT&T and Bell South Corp.

Information firms in the IIA are increasingly joining forces with ADAPSO companies to deliver their services and find ways to reach new markets, says Joseph J. Fitzsimmons, president of University Microfilm International, a Bell & Howell Co. subsidiary in Ann Arbor, Mich.

"Really, we're all in the information industry, as we define it. More and more we're working together and coming together," he said. But critics say that the merger would create a much too diverse organization, with an unwieldy mix of publishing, videotex, software, information retrieval, data networking and computer services firms.

'Small and effective'

Jerome L. Dreyer, former executive director of ADAPSO, said he opposes the merger. The diversity of the large organization will dilute its resources, reduce its effectiveness and make it more difficult to lobby in Washington, he said, adding, "I believe you can be small and effective."

Dreyer said he discussed a merger with IIA at least 12 years ago and again three years ago, but both parties rejected the idea. They decided it was best to have several groups in Washington to represent different segments of the computer industry, he recalls.

Even if the merger is completed, debates will continue. As trade associations grow, they find that the diversity of membership makes it difficult to arrive at a single, unambiguous position on public-policy issues.

Data access goes digital

BY ELISABETH HORWITT
CW STAFF

BRIDGEWATER, N.J. — A product that is expected to be announced today would allow regional Bell holding companies to provide a much wider segment of their customer base with high-speed digital data services — without having to wait for Integrated Services Digital Networking (ISDN).

Integrated Network Corp.'s Integrated Data/Voice and Universal Switched Data Capability (IDV/USDC) system is a plug-in add-on unit that allows regional carriers to provide 19.2K and 56K bit/sec. digital data transmission over existing 1AESS switches that support customer analog dial-up networks, according to Stuart Salter, Integrated Network marketing director.

The plug-in units, which will cost approximately $2,000 apiece and can be installed or relocated in a few minutes, will eliminate the up-front cost of installing a digital switch, Salter explained.

It costs between $2 million and $20 million to install AT&T or Northern Telecom, Inc. digital central office switches that support current high-speed digital data services such as Nynex Corp.'s Switchway, Salter said.

As a result, the regional holding companies have found it difficult to cost-justify digital services for any except high-demand areas, he added.

"The Federal Communications Commission doesn't like the operating companies raising everyone's rates just to provide a service to a few customers," he said.

T1 struggle

FROM PAGE 1

over NET's high-end IDNX/70, which will support up to 64 T1 lines in the next release, a NET spokesman said. The current IDNX/70 supports up to 32 T1 lines.

Timeplex's current high-end T1 switch, the Link/1, can support up to 30 T1 links, according to Timeplex senior manager William Flanagan.

Timeplex also is expected to introduce its Unified Network Management System (UNMS), a centralized, minicomputer-based network management control system that will allow users to manage Timeplex's full line of networking products from one location for the first time, according to Flanagan.

The new system will be able to monitor, configure and collect error and usage statistics from both the Link Network Management System (LNMS), which manages Timeplex's T1 switch networks, and the Prophet system, which manages Timeplex modems and multiplexers.

Sorting stats

Where the IBM Personal Computer AT-based LNMS and Prophet only perform real-time network management functions such as monitoring and configuration, the UNMS will also be able to collect network statistics and store them in a data base for analysis, call accounting and capacity planning, Flanagan said. It will also incorporate a "more sophisticated user interface that may include graphics," he added.

The centralized management system will give network managers the ability to control and monitor multiple Timeplex networks from one location, according to Flanagan.

"The UNMS is something that Timeplex really needs, since all of its major competitors have an equivalent system," Rahe said.

Temperatures rising

Another source of tension between NET and Timeplex is the fact that IBM has been negotiating recently with both companies about the possibility of reselling their equipment.

The Timeplex talks reportedly broke down recently because the T1 vendor did not want IBM to resell its equipment abroad, thereby competing with Timeplex's own international distribution channels.

IBM reportedly has begun negotiating with NET for the rights to resell its equipment. "NET has no international distribution, so that should not be a problem for them," Rahe said. NET recently announced that it was talking with IBM but did not specify the topic.

Banyan to further PS/2, Apple support

BY PATRICIA KEEFE
CW STAFF

ATLANTA — Banyan Systems, Inc. will demonstrate support for both IBM's Personal System/2 family and Apple Computer, Inc.'s Appletalk and Macintosh environments at Comdex/Spring '87 here today, a spokeswoman said last week.

Westboro, Mass.-based Banyan is the developer of the Vines virtual network operating system and servers.

Banyan is able to provide support for the PS/2s because it has earlier implemented the Tokreui driver, a subset of IBM's Personal Computer Local-Area Network (LAN) Support Program that is a prerequisite for the new PS/2 adapters.

Support for Microsoft Corp.'s MS-DOS 3.3 is expected to be included in today's announcement. Banyan provides simultaneous support for MS-DOS 2.0 through 3.3 on its network.

The PS/2 Models 50 and 60 will connect to a Vines network through the IBM Token-Ring Adapter/A, which supports IBM's Micro Channel bus. Running as a workstation under Vines, PS/2 Model 30 support will be available on a variety of networks, including IBM's Token-Ring and PC Networks; Nestar Systems, Inc.'s Arcnet; Proteon, Inc.'s Pronet-4 and Pronet-10; 3Com Corp.'s Ethernet; and Ungermann-Bass, Inc.'s Net/One LAN.

Support for the PS/2 Model 80 is slated for later this year.

Banyan said it also will announce support for Berkeley, Calif.-based Centram Systems West, Inc.'s TOPS icon-based network operating system. There is no formal marketing agreement between the two companies.

Under the Banyan solution, TOPS will be installed on an IBM PC or compatible supported by a Banyan file server running Vines, a Centram spokeswoman said.

Available for local processing, the PC also functions as a bridge between the Macintosh and IBM worlds, allowing users to share files with each other and access files stored on the server.

TOPS gives stand-alone Macintoshes or those running over Appletalk the ability to transparently access files stored on the server. Using TOPS for the Mac, directories on the server appear as Macintosh icons. On the PC side, directories will appear in MS-DOS format.

The Vines-Appletalk connection is accomplished using the Appletalk network cabling.

PC Slave receives 286 upgrade

BY PATRICIA KEEFE
CW STAFF

ATLANTA — Alloy Computer Products, Inc. is expected to introduce its long-awaited Intel Corp. 80286-based upgrade to the PC Slave product family at Comdex/Spring '87 here today.

That introduction will reportedly be followed up with a series of products linking into IBM 370 mainframes, System/34, 36 and 38, Systems Network Architecture (SNA) and Token-Ring networks as well as Digital Equipment Corp. VAX environments.

The PC Slave/286 will support up to 31 cards and six printers and correlate with either the IBM Personal Computer XT 8-bit bus or the PC AT 16-bit bus. Since a PC AT will not support 31 cards, Alloy suggests that users link together as many as three Alloy PC-Xbuses, a box with 12 slots that can be cabled to an AT, said Dave Friesen, Alloy's director of product marketing.

Each PC Slave/286 card will have 1M byte of random-access memory, so memory is private to each user, eliminating the need to subdivide memory within the host AT.

The PC Slave/286, which will retail for $1,295, is set to go into beta test in June and to ship in August.

Alloy is also expected to unveil a token-ring network compatible with its PC Slave line.

Later this month, the Framingham, Mass.-based manufacturer will reportedly begin shipping Mainline, a micro-to-mainframe link supporting SNA communications capabilities.

One Mainline card will replace an IBM 3274 cluster controller and, as such, provide connection into an SNA network, Friesen said.

Mainline will provide 32 mainframe sessions assignable to a single terminal or several terminals and allow PC printers to be used as if attached to a 3274 cluster controller.

"Now any Slave card can act like an [IBM] 3278 terminal linked to the SNA environment," Friesen said.

PC Slave compatibility

Mainline is said to be compatible with the entire PC Slave family. Set to be available in mid-June, the card will be manufactured by Information Technologies, Inc.

Mainline is currently in beta-test sites and will cost $3,000, according to the vendor.

Alloy said it intends to retrofit the Mainline and PC Slave cards to provide compatibility with IBM's Micro Channel bus. In the meantime, PC Slave users attached to either Alloy's PC-Xbus or Plus4 networking systems can use Alloy's recently announced HI/2 host interface adapter to indirectly connect into the IBM Micro Channel bus, Friesen said.

"We should be able to deliver token-ring cards and software on microcomputer networks this fall," Friesen said.

After plugging a token-ring card into a host PC AT, PC Slaves attached to the host will appear as individual computers attached to the token ring and will be able to talk to any other machine on the network, he said. Alloy is writing the software but may act as an OEM for the card from another token-ring vendor.

Fall introductions

The company also said it plans a fall introduction for products that "speak directly to the System/34, 36 and 38 series," including providing IBM 5251 emulation.

This fall or winter, the company is expected to unveil products providing connectivity to DEC's VAX family. Alloy will start with terminal emulation and follow with products providing connectivity at the file level, Friesen said.

IBM connectivity is Alloy's first priority, according to Friesen.

Alloy said it is considering connectivity with the Apple Computer, Inc. Macintosh environment but is unlikely to move in this direction unless Apple proves successful in garnering corporate accounts.

ADR harnesses PC LANs for host development

Adlib enables programming teams to share files with host application environments

BY CHARLES BABCOCK
CW STAFF

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) last week introduced a low-priced personal computer-based development system that the firm said will allow applications programming teams to use networked PCs for developing mainframe applications in conjunction with a host development environment.

ADR/Adlib, priced at $495, runs on the IBM Personal Computer XT, AT and compatibles with attached hard disk or the IBM 3270 Personal Computer and can share files with ADR's host development environments, ADR said. As a development system, it borrows many features of ADR's Librarian, a change-control product for mainframe source code programs.

At the same time, the system allows PC users on an IBM Token-Ring or PC Network local-area network (LAN) to work on applications in Cobol, PL/I or assembler languages and upload them to the host for compiling into production programs, said Joseph Farrelly, ADR's vice-president of research and development.

Adlib reportedly also mimics the mainframe environments provided by ADR's Roscoe and Vollie, development systems for IBM's MVS and VSE operating systems, respectively. The $495 product can download data or programs from these environments and work with them on a PC. Once a program has been modified, only the changes are sent back to the mainframe, saving host CPU cycles, Farrelly said.

Adlib is the first of what ADR claimed will be a series of products that tie personal computers and LANs to the mainframe. ADR said it will announce a micro version of its fourth-generation language, Ideal, to be called Ideal Escort, later this month. The company told its users group in September 1986 that it was investing heavily in products that address PC-to-mainframe processing. ADR officials said they view that alternative as the one most likely to be invoked by departmental users.

The Princeton-based mainframe systems house incorporated a number of personal computer features into the Adlib development environment. In addition to the subsecond response time provided by the PC, an Adlib beta-test site user cited the system's windowing feature as an innovation brought to the mainframe development world via PC technology.

Adlib can reportedly partition PC memory into six active work spaces with a total of 390 windows. Robert F. Cangemi, branch manager for a New Jersey consulting firm that specializes in custom applications for the financial services industry, said a programmer can work with multiple copies of a program, reverting to an earlier version when he is trying to incorporate a particular function.

'Split screen sex appeal'

"The split screen is what gives Adlib sex appeal. A programmer can pull different versions of the program into windows, and if he changes a line in one, it will be automatically changed in any other window," Cangemi said.

Adlib reportedly can save up to 1,000 versions of a program during a work session without permanently storing multiple copies. Cangemi said saving that many versions was unrealistic but that a programmer might want to work with as many as 15 to 20 versions.

A second beta-test site user, Dennis S. Markham of the Fresno Unified School District in Fresno, Calif., said Adlib provides needed change-control features at the PC level. For example, a source code program being worked on by one programmer cannot be accessed at the same time by another programmer, and an audit trail of changes is kept from version to version.

Adlib is said to monitor a data transmission to watch for interruptions that would disrupt the integrity of the program and necessitate recovery procedures. Its ability to upload only changes in a source code program "definitely increases the chances of an accurate transfer," Markham said.

Neither Markham nor Cangemi has attempted to use Adlib in conjunction with the Vollie or Roscoe mainframe environments. Farrelly said a programmer on a PC can scroll through 10,000 lines of a Cobol application in those environments, selecting the few lines he wishes to work on and downloading them to a PC. A built-in communications link invokes the necessary IBM JCL in the background in response to simple Adlib commands, such as SUBMIT, he said.

In addition to developing or modifying mainframe applications, Adlib could be used to develop PC applications as well, Farrelly said, calling it a "generalized" application development environment.

Markham said the Fresno school district has no LANs, but he predicted Adlib would be most useful in tying PC users to the mainframe without them having to learn JCL for submitting jobs remotely.

Adlib requires 350K bytes of a personal computer's memory and IBM PC-DOS Version 2.0 or higher. It supports IBM's Token-Ring and PC Network.

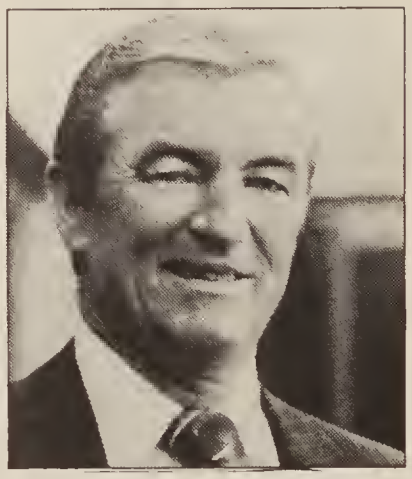
Adlib also supports IBM's TSO, allowing it to download IBM OS data sets, Farrelly said.

Amdahl shuffles execs; Lewis named new head

SUNNYVALE, Calif. — Amdahl Corp. last week announced a shift in top management that it said represented a logical succession for the executives involved.

Amdahl Chief Executive Officer John C. Lewis, 51, was named chairman of Amdahl, replacing Eugene R. White, 55. White stepped down from the chairman position to assume the vice-chairman role. Lewis will retain his role as chief executive officer.

Lewis has served as Amdahl's president for the past 10 years. Formerly, he held positions with IBM and Xerox Corp.



Eugene R. White

Lewis has presided over Amdahl's recent resurgence after approximately two years of lackluster earnings. A favorable product cycle for the firm's 5890 series mainframes, as well as stronger-than-expected shipments of those CPUs, has fueled the turnaround.

In its first quarter ended March 31, Amdahl recorded its best performance ever in sales and earnings. Profits of $25.2 million represented a 950% increase from year-earlier levels, while revenue grew 59% to $318.5 million.

Amdahl spokesman Richard Whitcomb said there was "nothing unusual" about White's movements within the company.

The company also announced that Chief Operating Officer E. Joseph Zemke replaced Lewis as president. Zemke, formerly the president and chief operating officer of Autotrol Corp., will continue in his position as Amdahl's chief operating officer.

Lessors battle

FROM PAGE 1

another matter. I think any prudent man would assume that we know what we're doing."

Cherney's challenge centers on the equity ownership of Bloomfield Hills, Mich.-based CMI, which is 70% owned — through CMI Holding Co. — by financial services firms Torchmark Corp. and Stephens, Inc. The lawsuit asks the court to decide whether Torchmark and Stephens complied with a shareholder agreement in buying out the 30% equity position of a management group led by Cherney, then selling the whole company to CIS.

Cherney's group offered $45 million to Torchmark and Stephens but was outbid by CIS, according to Goetzmann. Cherney was unavailable for comment, and a CMI spokeswoman said the company would not comment beyond its brief press release on the lawsuit.

CMI is the U.S.'s third largest computer leasing firm, with some $350 million in annual revenue, and publicly traded CIS is No. 4, with about $300 million, according to L. Crandall Hays, director of research for Milwaukee-based investment firm Robert W. Baird & Co.

If approved, the merged company will join IBM Credit Corp. and Comdisco, Inc. in the upper tier of the leasing industry. In the past year, CIS and CMI wrote leases on more than $1.3 billion in equipment, some of it noncomputer capital goods.

"It should help both companies with economies of size and scale," Hays said. "Most of the money in this business is made on remarketing, and they will have more equipment and more contacts."

Caught in the middle

Goetzmann, who founded CIS in 1968, said both CIS and CMI were caught in the middle between small niche firms and giants Comdisco and IBM Credit. "With the loss of the investment tax credit, medium-size companies — particularly privately held ones — no longer have the financial wherewithal to acquire as much equipment as they need," he said. "I believe companies in that position either have to grow or die."

Goetzmann said some of the merged operations may overlap but declined comment on any potential cuts or consolidations. The combined firm would retain the CIS name and have about 900 employees, he said.

"They would probably keep the same salesmen calling on the same accounts, and the customer may not even know the difference," Hays said.

Hays pointed out that CMI is one of the industry's leading firms in leasing telecommunications equipment, a major growth area for the leasing business. "The acquisition would strengthen CIS considerably in that area," he said.

CMI was founded in 1969 and became a wholly owned subsidiary of Birmingham, Ala.-based Torchmark in 1982. Last year, Torchmark sold 60% of the unit, then renamed CMI Holding Co., to the management group led by Cherney and to Little Rock, Ark.-based Stephens. Cherney's lawsuit was filed last Wednesday in U.S. District Court in Birmingham.

Both Cherney and Goetzmann have been highly active as officers of the Computer Dealers and Lessors Association, the independent leasing industry's nationwide trade and lobbying organization.

In addition to the purchase price of $50 million, CIS, under terms of the agreement with Torchmark and Stephens, would satisfy $55 million of CMI debt with $20 million in cash and $35 million in bond issues.

Second-class postage paid at Framingham, Mass., and additional mailing offices.
Computerworld (ISSN-0010-4841) is published weekly, except: January (5 issues), February (5 issues), March (6 issues), April (5 issues), May (5 issues), June (6 issues), July (5 issues), August (6 issues), September (5 issues), October (5 issues), November (6 issues), December (4 issues) and a single combined issue for the last week in December and the first week in January by CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171.
Copyright 1987 by CW Communications/Inc. All rights reserved.
Computerworld can be purchased on 35 mm microfilm through University Microfilm Int. Periodical Entry Dept., 300 Zeeb Road, Ann Arbor, Mich. 48106. *Computerworld* is indexed: write to Circulation Dept. for subscription information.
Photocopy rights: permission to photocopy for internal or personal use or the internal or personal use of specific clients is granted by CW Communications/Inc. for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $3.00 per copy of the article, plus $.50 per page is paid directly to Copyright Clearance Center, 21 Congress Street, Salem, Mass. 01970.
Permission to photocopy does not extend to contributed articles followed by this symbol. ‡
Special requests for reprints and permission should be addressed to Nancy M. Shannon, CW Communications/Inc., 375 Cochituate Road, Box 9171, Framingham, Mass. 01701-9171. Subscriptions call toll free (800) 544-3712 or (215) 768-0388 in Pennsylvania.
Subscription rates: $2.00 a copy: U.S. — $44 a year; Canada, Central & So. America — $110 a year; Europe — $165 a year; all other countries — $245 a year (airmail service). Four weeks notice is required for change of address. Allow six weeks for new subscription service to begin.
POSTMASTER: Send Form 3579 (Change of Address) to *Computerworld*, Circulation Department, P.O. Box 1016, Southeastern, PA 19398-9984.

INSIDE LINES

Heaven's gate. IBM is expected to unleash a flood of communications announcements this month that, according to several observers, will include a 16M bit/sec. version of its Token-Ring network. However, at least one watcher warns that current users of the 4M bit/sec. Token-Ring should not expect to be able to upgrade to the new version. Instead, IBM is expected to offer gateways among the older networks and the 16M bit/sec. version.

All the president's men. With the shortage of IBM Token-Ring boards forcing users to turn to alternative offerings, one might think token-ring vendor Proteon would be flying high. Instead, Proteon just lost President Francis Scirocco, its second president in two years and the latest in a series of Proteon execs to take a walk. Proteon recorded a loss two quarters ago, forcing a layoff of about 10% of the work force. Several analysts lay partial blame for Proteon's woes on its less-than-successful efforts to develop a distributor and dealer base.

Gone with the wind. Users looking for IBM's external 3½-in. drives for their installed base of 5¼-in. floppy-disk-based Personal Computers and compatibles might want to turn their attention to Comdex/Spring '87 this week. IBM had announced May availability for its drives but quietly "redefined" that date, which now reads August. Meanwhile, similar products from third parties are expected to debut at Comdex.

One flew over the cuckoo's nest. Taking a page from retailer Crazy Eddie, Dave Norman's Businessland retail chain auctioned off about $5 million in merchandise last week in San Francisco. The first-time event reportedly featured some "insane" prices. The IBM System/36 Model 21 went for a "pathetic" $1,600, while the IBM RT Personal Computer and RT PC Model 20s went for $500 and $750, respectively. RT PCs have retailed for approximately $10,000. Also in the lot were IBM PC XTs for $750 to $850, PC ATs for $2,000 to $2,200 and Compaq Portable 286 IIs for $1,200 and Model IIIs for $1,600 to $1,700.

Lethal weapon. Supplies of IBM Personal Computer ATs and XTs are said to be dwindling fast, thanks in part to "panic ordering" following IBM's April 2 unveiling of the Personal System/2 line. A dealer who received an order for 30 ATs said he'll be lucky to deliver five. IBM recently cut the price of the AT and is said to be virtually out of the product. Not only is IBM expected to stop making the XT and AT by the fall, but one consultant reports that an IBMer told one of his clients "in an offhand remark" that IBM will no longer support the XT after this year.

The secret of my success. In its first full quarter since massive restructuring and layoffs, Datapoint Corp. reported a third-quarter profit of $4.4 million, or 20 cents per share, on revenue of $78.7 million. Although earnings were 23% below year-earlier levels, they represented a major turnaround from Datapoint's recent misfortunes. The minicomputer maker took charges of $56.8 million related to the second-quarter restructuring and has reported a nine-month loss of $65.9 million on revenue of $224.5 million.

Midway. All that fuss about Japanese semiconductor giants swallowing up weakened American chip companies may be fading fast. Fujitsu Ltd., Japan's largest chip maker and one-time wooer of Fairchild Semiconductor in Silicon Valley, posted a 45% net profit decline for its fiscal year ended March 31. The yen's rise against the dollar was said to be a major factor in the decline. Meanwhile, the resurgence in the Valley is continuing, with companies such as Cypress Semiconductor and Monolithic Memories reporting profit increases.

My science project. Honeywell Bull plans to continue to revamp its mid-range and small mainframe product lines this month with the introduction of a replacement for the DPS 8 mainframe and enhancements to the DPS 6 Plus minicomputers. It was less than two months ago that Honeywell Bull, formerly Honeywell Information Systems, replaced the DPS 7 mid-range systems with new models.

MORE THAN JUST
THE BASIC NECESSITIES.

KEYFAST

ONLINE · DATA · ENTRY

THE MOST INSTALLED
ONLINE DATA ENTRY
SYSTEM WORLDWIDE

Cutting costs. Cutting response time. Without cutting quality. KEYFAST, the CICS Data Entry System, saves the user time and money. It doubles data entry productivity and gives users the most complete set of data editing routines available. Its Data Dictionary makes many commonly needed user exits unnecessary. The LANGUAGE, H&M's powerful end user programming language, enables users to define special field validations. KEYFAST is easy to install and can be used immediately. KEYFAST is simple. It allows non-expert users to paint complex formats and editing rules online. It guides users with multilingual menus, Help Screens with notepads, messages and message explanations. KEYFAST's flexibility provides comprehensive checks: alphanumeric, numeric, binary, packed and entry/verify fields, range checks, table lookup; search, mass change, select, merge, copy and sort functions. KEYFAST is powerful: automatic field duplication, shorthand, mathematical functions and totals for data management; extensive batch processing; data extract on any storage media, select, duplicate, modify, extend or reformat records. KEYFAST offers password, application, task, function and batch security.

H&M.
SOFTWARE'S FUTURE

H&M Systems Software, Inc., 25 E. Spring Valley Avenue
Maywood, N.J. 07607-9982, Phone: 1-(201) 845-3357
TOLL FREE: 1-(800) FOR DEMO

MAIL FOR MORE INFORMATION

Name

Company

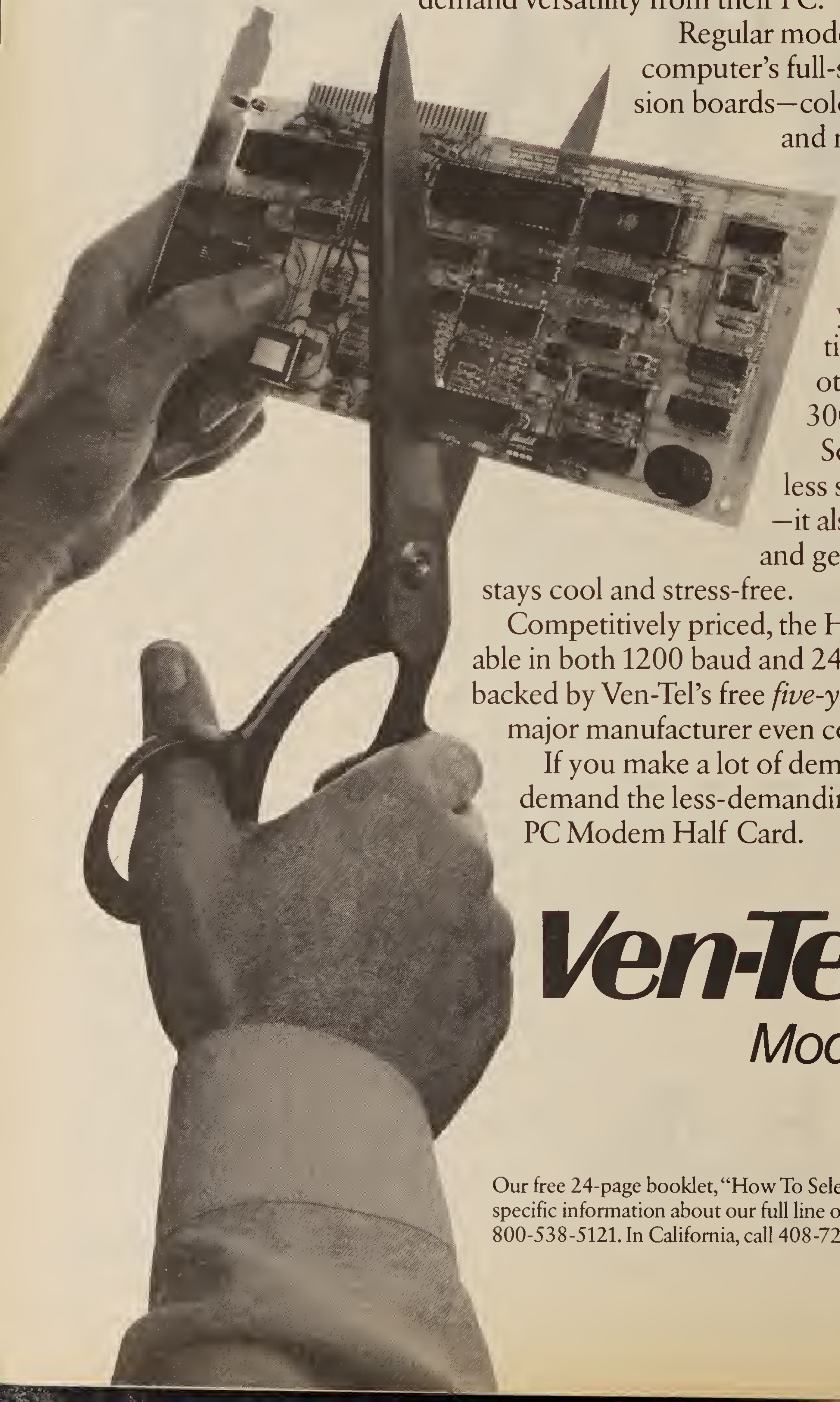
Department

Street

City, State, Zip

CPU Op.System

H&M Systems Software, Inc., 25 E. Spring Valley Ave.
Maywood, N.J. 07607-9982, Phone: 1-(201) 845-3357



We invented the modem that makes fewer demands on your PC.

The Ven-Tel Half Card™ modem. All the power and speed of our regular modems, but with some major advantages for people who demand versatility from their PC.

Regular modems plug into one of your computer's full-size slots. Just like expansion boards—color boards, graphics cards and memory expanders.

The Ven-Tel Half Card modem is different. It plugs into a short slot, freeing up a long slot so your PC can handle an additional function. And while other modems have about 300 components, ours has 70. So it not only demands less space from your computer—it also demands less power and generates less heat. Your PC stays cool and stress-free.

Competitively priced, the Half Card modem is available in both 1200 baud and 2400 baud speeds. And it's backed by Ven-Tel's free *five-year* warranty. No other major manufacturer even comes close.

If you make a lot of demands on your PC... demand the less-demanding modem: The Ven-Tel PC Modem Half Card.

Ven-Tel
Modems

Our free 24-page booklet, "How To Select The Correct Modem," contains specific information about our full line of modems. To request your copy, call 800-538-5121. In California, call 408-727-5721.